1985

The Philippine Journal of Otolaryngology Head & Neck Surgery

1985

The Philippine Journal of

THE PHILIPPINE
JOURNAL OF
OTOLARYNGOLOGY –
HEAD & NECK SURGERY

Official Publications of the Philippine Society of Otolaryngology – Head & Neck Surgery, Inc.

The Editorial Staff

Board of Editors

All manuscripts and other editorial matter should be addressed to Angel Enriquez, M.D., Editor-in-Chief, The Philippine Journal of Otolaryngology–Head & Neck Surgery, Philippine General Hospital – Ward 3, Taft Avenue, Manila.

A C K N O W L E D G E M E N T

The publisher and the editorial staff would like to give due recognition to Boehringer-Ingelheim (Phil .), Inc., specially to its Medical Director, Dr. Primitivo D. Chua, and Ledesma Audiological Center, Inc., King-Aid Philippines, particularly to its President and Audiologist, Nelly R. Ledesma, for their support and assistance, without which this would not have been possible.

THE PHILIPPINE
JOURNAL OF
OTOLARYNGOLOGY –
HEAD & NECK SURGERY

Official Publications of the Philippine Society of Otolaryngology – Head & Neck Surgery, Inc.

The Editorial Staff

Board of Editors

All manuscripts and other editorial matter should be addressed to Angel Enriquez, M.D., Editor-in-Chief, The Philippine Journal of Otolaryngology–Head & Neck Surgery, Philippine General Hospital – Ward 3, Taft Avenue, Manila.

THE PHILIPPINE JOURNAL OF OTOLARYNGOLOGY
HEAD & NECK SURGERY
1985

CONTENTS

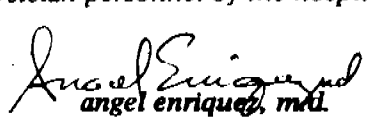
EDITORIAL

BEYOND CHALLENGE

Oral and Maxillofacial Surgery in the Philippines has always been and will always be within the realm of Otolaryngology – Head & Neck Surgery, where it is considered one of its strongholds. Be that as it may, conflict of interest is inescapable where other specialties exist so close.

Until recent years, our friends in the field of Dentistry have sent feelers, if subtle, to expand into the field of Oral Surgery. "Instead of separate and independent programs being conducted by (the Departments of) Otorhinolaryngology, Orthopedics, and Plastic & Reconstructive Surgery" at the UPCM-PGH Health Sciences Center), the dental people would like "these diverse disciplines to come together and set up one training program that is not department-based, but hospital based" where all (including dentists) can work in a collaborative effort.

Tasked to study and assist in decision making, the Department of Otolaryngology – UPCM-PGH Health Sciences Center, in a position paper, expressed concern over the training program in Oral Surgery as submitted by the Department of Hospital Dentistry but nevertheless gave its wholehearted support provided completion of the regular undergraduate medical curriculum in an approved medical school in addition to the 4 years of formal dental education, be made a pre-requisite to ensure the highest possible quality health care. Anything short of this requirement was deemed totally unacceptable as quality has always been a casualty of new initiatives especially when the proponents are non-physician personnel of the hospital.



angel enriquez, md.

THE PHILIPPINE JOURNAL OF OTOLARYNGOLOGY
HEAD & NECK SURGERY
1985

CONTENTS

REXTON

The Selectra Concept

The REXTON Selectra instrument concept is the result of more than 30 years of hearing aid experience as well as first hand knowledge of microtechnology within the electronic industry. We believe the REXTON Selectra will be recognized as the most advanced hearing instrument available today.

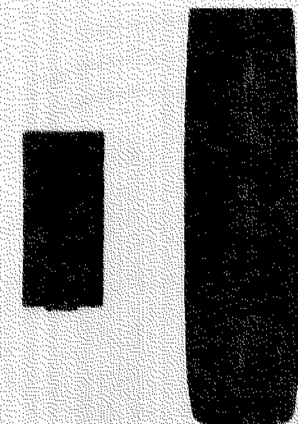
Completely modular in design, the Selectra provides unparalleled reliability and serviceability. Most importantly, Selectra introduces a new era in hearing aid fitting flexibility in compact, sleek styling. Multiple slide trimmers make it possible to custom fit almost any hearing loss.

Special Features and Characteristics

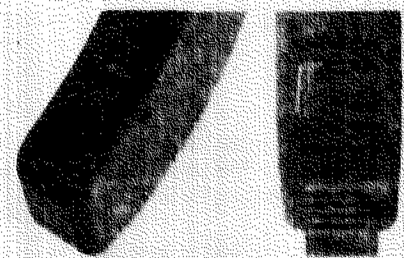
Selectra features a state of the art active low frequency filter which offers wide range adjustability to individual needs. The user enjoys listening comfort and increased discrimination with less low frequency disturbance.

Five additional trimmers provide for gain, high frequency adjustment, and output (peak clipping) as well as a choice of input and output AGC. The unique output AGC may be used in combination with peak clipping or individually. All controls may be preset when ordered or set at the time of fitting to meet simple or the most complex audiological requirements.

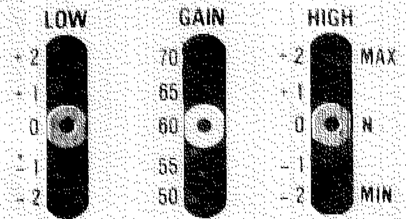
Audio-input and T/MT/M switch are standard. Soon, sophisticated Selectra models will include multichannel functions, either pre-programmed or programmable in addition to a super power version. The future is now with the Selectra PP-6.



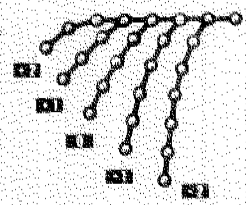
Peak SSPL90	135dB
Peak Full-on gain	71dB
Frequency range	200-6000Hz



Easy fitting procedure using 6 trimmers

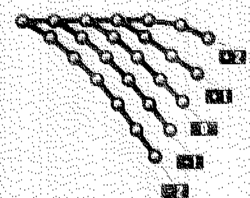


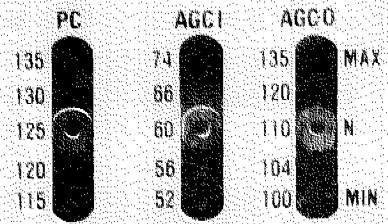
1. Low



2. Gain — continuously variable from 50 to 70dB

3. High





Compression and limiting systems

4. PC — continuously variable from 115 to 135dB
5. AGC-I — continuously variable from 52-74dB
6. AGC-O — continuously variable from 100 to 135db

KING-AID PHILIPPINES

LEDESMA AUDIOLOGICAL CENTER INC

LOWER LEVEL, MAKATI CINEMA SQUARE, COR. PASONG TAMO & PASAY RD., MAKATI, METRO MANILA
TEL. NOS. 818-85-64 / 87-40-81 up to 85 loc. 20

Accredited by the Philippine Board of Otolaryngology

HARRISON PLAZA: 2nd Floor, HP Commercial Center (Near Escalator, M. Adriatico St.) Ermita, Metro Manila. Tel. Nos. 495767; 486829

ESCOLTA: Room 308, Second Floor, Regina Bldg., Escolta, Manila. Tel. Nos. 495767; 486829

CUBAO: Ground Floor, ALI MALL, Araneta Center, Cubao, Quezon City. Tel. No. 9223734

CEBU: Ground Floor, GMT Bldg. Cor. P. del Rosario/Junquera Sts., Cebu City. Tel. No. 77419

DAVAO: Pascasio Reyes St. (Across Mintal Central School) Davao City. Tel. No.

PRESIDENT'S PAGE

A CHALLENGE TO THE FILIPINO DOCTORS
MATER ARTIUM NECESSITAS

"Necessity is the mother of all inventions."

From the very beginning when primitive man first discovered the use of fire for cooking his food and probably to protect himself, to the harnessing of the power of the atoms, both for peaceful and sometimes not so peaceful use, to the latest advances in electronics which provides man the modern conforts that we now enjoy, he have always been faced with a necessity and have always met the challenge to emerge victorious.

In these times of economic crisis and hardships, the Filipino medical practitioners, due to circumstances not necessarily to our liking, suddenly wakes up to find ourselves face to face with a tremendous new challenge in the practice of our profession.

We are confronted with the problem that while the value of our peso is getting less and less, that of the almighty dollar keeps going up and up. Since most of our medicines, medical & surgical instruments have to be imported, we come to the bitter realization that in the coming days, to acquire these things will become more prohibitive if not altogether prohibited. In simple lingo if something is not done pretty soon proper medical care will be out of the reach for the Common "Tao."

This is now the predicament facing us, Filipino sons and daughters of Hippocrates. We must come to the aid of our nation and people. Let us show the world that Filipinos are made of sterner stuffs and can rise with the demands of the times. Our colleagues have been in worse situations than what we are facing now. They have managed admirably during the Japanese occupation when no imported medicines or surgical instruments were available.

How then are we to meet and overcome the forthcoming dilemma? It is not going to be easy, it will take the combine dedicated efforts of all the people concern. However, let us take comfort in the knowledge that Filipino's ingenuity and practicality have ne er failed us in difficult situations before. The demand of the Times therefore calls for the following measures.

(1) We have to cut down on our penchant for prescribing the latest and the most expensive medicine when a simple and much less costly drug will do the job just as well. Oftentimes we prescribed compounded medicines (with the added cost of course being charged to the patient) when there is no need for the extra component for the well being of the patient.

(2) We should avoid ordering costly and unnecessary laboratory and other diagnostic procedures. Many of these new procedures have undoubtedly made our task much easier. However, sad to say, a few of our colleagues have abused their use. Dear doctors, sometimes our old reliable clinical acumen can still do wonders – and be depended on.

(3) Lastly we have to give more emphases to the value of research works. This is where our government could probably help. We do not have a lack of young and talented doctors willing to do research works. The only thing keeping them away is the lack of funding, which often times to come from their own meager resources or sometimes from some public service oriented pharmaceutical companies. Research works should be encouraged on the search & testing of our local herbal plants for their possible medicinal values. Researches should also be geared toward manufacturing our own medical & surgical instruments. This will being down their costs, beside conserving our precious dollar reserves.

I'm very proud that our society have done its part in the field of local research. To date, our researchers have come up with some very interesting & valuable works like: the use of locally made ENT headlights: a locally made operative nerve stimulator; the use of human hair as suture materials; and the use of a local herbal plant in the treatment of pharyngitis. I'm very sure other specialty societies are doing the same thing.

Before I conclude allow me to quote from another great man, "The greatest thing in the world is to know how to be sufficient unto oneself." Montaigne

JESUS CO, M.D.

RECONSTRUCTIVE SURGERY OF A SEVERELY DAMAGED NOSE

E. Guevarra, Jr., M.D.*
R. Nonato, M.D.**
F. Nolasco, M.D.**
J. E. Lopez, M.D.**

Mutilation of the nose as a result of trauma, infections, tumour ablations or congenital deformities is a severe affliction that impedes normal social contact, and creates great self-identity problems. This disfigurement imposes serious limitations on the activities of the patient, even among the elderly. Numerous methods of replacing, repairing and restoring this most prominent unique organ of the face, so important to human aesthetics, have been devised.

Historical Review

Nasal reconstruction is also an ancient art. Although this is not meant to be a historical review, some classic references should be mentioned to give the proper perspective to this challenging problem. Eusebie, Mother Superior of the monastery of St. Cyr at Marseilles, France and her 40 nuns amputated their noses to avoid the lust of the Saracens who had taken the city. It had also been said that many British maidens used the same method to produce disfigurations on their faces to prevent the Vikings from sexually abusing them.[1] (Fig. 1) Pope Sixto V ordered the mutilation of the nose as punishment for the thieves who invaded Rome. (Fig. 2) Nasal amputation was also used in India

Fig. 1. Comic illustration how British maidens create disfigurations on their faces to stop the Vikings from sexually abusing them.

Fig. 2. Illustrator showing Pope Sixto V ordered the mutilation of the nose as punishment for the thieves who invaded Rome.

(600 BC) since time immemorial as a penalty for thieves and prisoners of war. The first written account in English of the Indian midline forehead rhinoplasty appeared in Madras Gazette.[2] In 1974, the account was later reproduced in London's Gentleman's Magazine. (Fig. 3)

Fig. 3. The Indian midline forehead flap for nasal reconstruction (600 BC).

Soon after publication of this report, Carpue, an English surgeon travelled to India to witness the operation for

*Assist. Professor, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
**Former Senior Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.

himself.[3] Delpech of Montpellier, France in 1828, published a report of the Indian method for congenital occulo-nasal deformity.[4] (Fig. 4) Tagliacozzi in the late

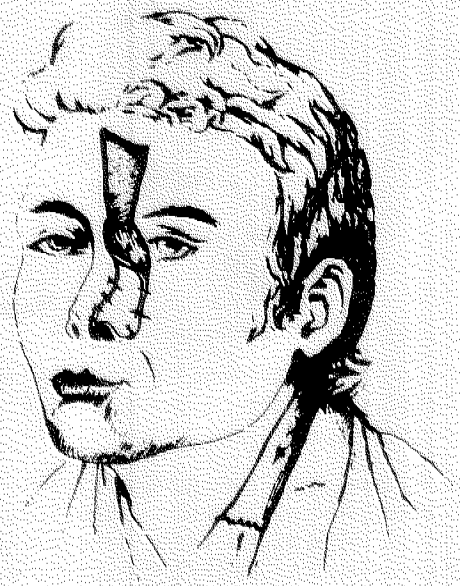


Fig. 4. Delpech of Montpellier, France demonstrated a midline forehead flap for an oculo-nasal cleft (1828).

16th century, perfected the technique of arm rhinoplasty known as the Italian method.[5] (Fig. 5) This technique is still being used at present when the forehead is too narrow as a large amount of tissue is required for the reconstruction or has been scarred by previous attempts at rhinoplasty and in facial burns. The disadvantages of the arm flap rhinoplasty are, it provides poor color and texture match, is a lengthy procedure, and requires uncomfortable immobilication. In their classic work published in 1904, Nelaton and Ombredanne stated, "There are three methods for nasal reconstruction: The Indian method of taking a flap from the forehead, the French method of the sliding flaps taken from the neighboring tissues of the face, and the Italian method of taking a flap from the arm or the forearm."[6] At present they are still the basic techniques in nasal reconstruction. Next came the combined procedures using both flaps and some materials for support which could be metallic or organic such as bone or cartilage. Bone and cartilage grafts gained fresh impetus during the period immediately preceding and following World War I. Since then many ingenious techniques and refinements were further developed. The recent ones are the Washio temporo-retro-auricular flap modified by Orticochea using the whole thickness of the concha with a reversal flow of the superficial temporal vessels, and the British technique of the subcutaneous island pedicle flap.[7,8,15]

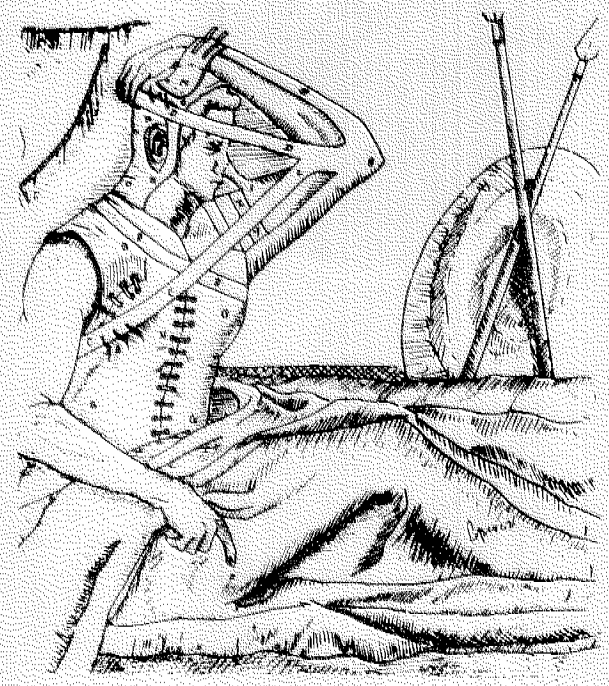


Fig. 5. Tagliacozzi technique of arm rhinoplasty (16th century).

Selected Case Examples

Patient 1

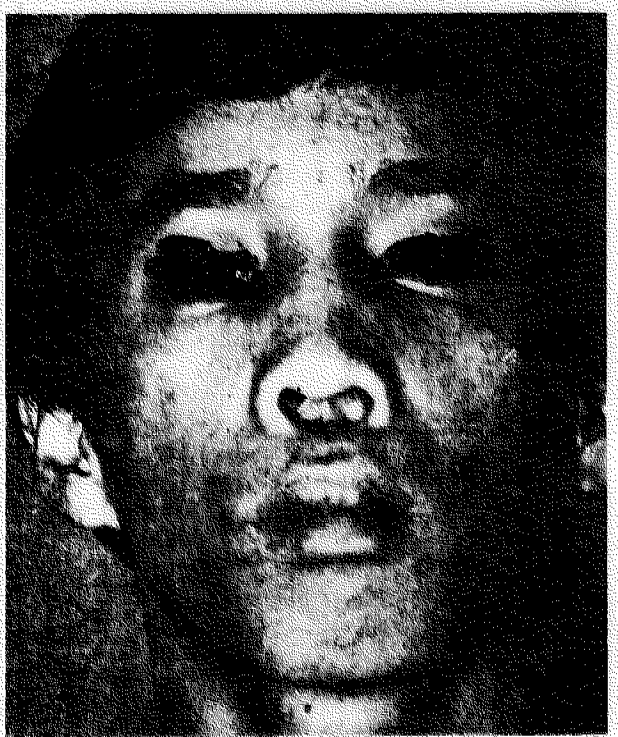


Fig. 7. D.A., 18-year-old, male, who had nasal infection at five years of age with subsequent loss of columella and partial tip of the nose.

D.A., 18-year-old young man who had nasal infection since he was five year-old. (Fig. 4) He was presented to us with no columella, partial loss of the tip of the nose as well as the anterior part of the nasal septum. The remaining septal cartilage was not adequate to support the nasal tip. So we chose to reconstruct this tip-columella-septal nasal defect with bone grafting and a bone strut support. The skin for the nasal tip and columella was repaired with a cervical tubed flap in a delayed waltzing stage procedure. (Fig. 8) We preferred

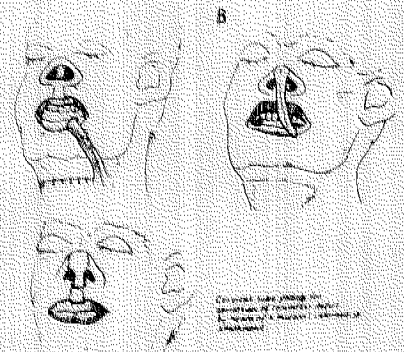


Fig. 8. Cervical tube flap along the submental region was utilized in a waltzing stage procedure for columellar skin reconstruction.

to use the cervical tubed flap for the reason that we could better camouflage secondary scars from the donor sites such as the forehead, fronto-temporal and nasolabial areas. Horizontal scars in the submental area are not so obvious although this will entail a longer procedure. The first stage was tubing, 2nd stage – detaching of one end of the tubed flap and attachment to the buccal mucosa of the lower lip. The 3rd stage was detachment again of one end of the tubed flap from the submental area and this was reattached to the tip of the nose. This tubing and transposition procedure were all done under local anesthesia. The last stage under general anesthesia was amputation of the tube to the length and size of the columella to be repaired. At the same time, bone grafting was done and harvested from the iliac crest.[8,9] We made a transverse external incision at the naso-frontal angle for better exposure and excellent healing elevating the skin flap up to the periosteum. (Fig. 9) The recipient pocket was disserted as deep as

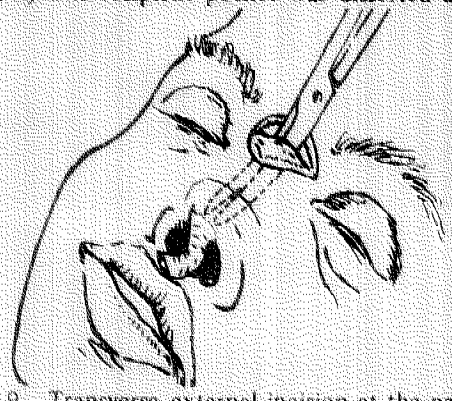


Fig. 9. Transverse external incision at the naso-frontal angle for better exposure in placing the bone graft.

possible directly over the existing bone and deep beneath the soft tissue and lower lateral cartilages at the tip. The greater amount of soft tissue over the graft, the lesser the chance that the graft will erode through the skin. A central groove was developed in the existing nasal bone with power-driven burr. (Fig. 10) Particular atten-

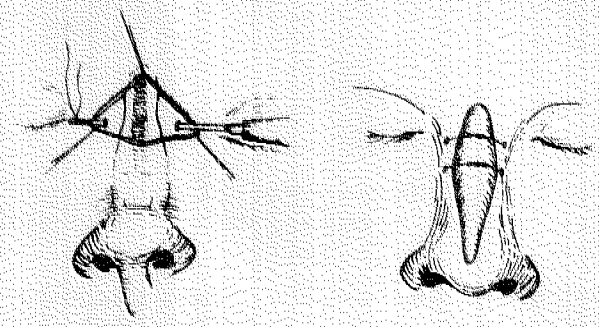


Fig. 10. A central groove was developed in the existing nasal bone with power driven burr. The interlocking ridge and groove provided alignment and stability.

tion was given to provide a wide contact surface and a good inset at the nasofrontal angle. The bone graft was then contoured specifically to fit the defect with a power-driven burr. On the posterior aspect of the graft, a ridge was developed to fit solidly into the groove prepared in the recipient bone. The interlocking ridge and groove provided alignment and stability.[10] The cancellous portion of the graft was positioned posteriorly in contact with the recipient bone to enhance union and neovascularization. If not, the bone graft would undergo complete resorption. (Fig. 11) Two wires were pass

Fig. 11. A columellar strut is necessary because the replaced columellar skin would soon contract inward and would not look esthetically acceptable in its profile view.

through transnasal drill holes and then looped over the graft and twisted tightly. Anteriorly, a rim of cortical bone was preserved to provide graft stability and strength for interosseouss wiring.[8,9] A columellar strut support is necessary in this case because the columellar skin that was repaired would soon contract inward if without such bony framework and would not be aesthetically acceptable in its profile view. The remaining septal defect was repaired with the use of buccal island flaps tunneled to our incissions in the floor of the dificient nasal septum.[11](Fig. 12) This incision is in continuity

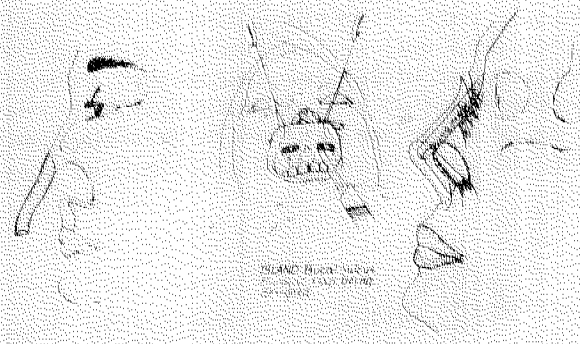


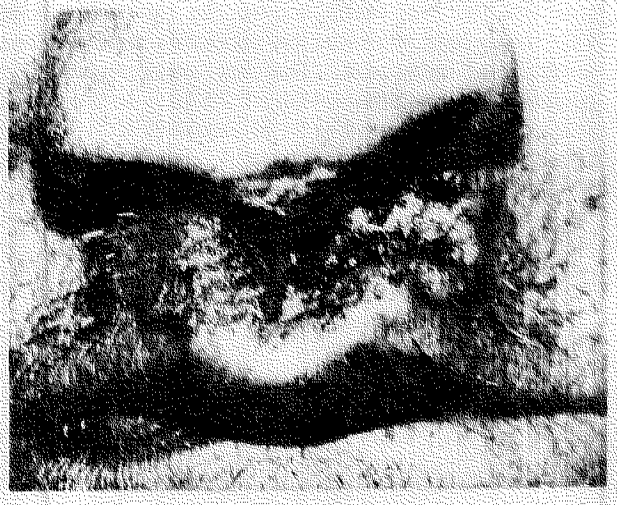
Fig. 12. The remaining lateral part of the columellar septal defect was repaired with the use of buccal island flap.

with our septal mucosa splitting incision along its anterior edge where we sutured the posterior margin of the buccal flap. The anterior edge of the buccal mucosal flap was sutured with the repaired columellar skin. It has been noted that bone graft, even with good take, will undergo minimal resorption.[8] We tend to place a sufficiently large bone graft thus allowing the soft tissues to stretch, to improve the saddle deformity, as well as strengthen the nose and partially correct the foreshortened appearance. (Fig. 13)

Fig. 13. Post-operative result, front and lateral view.

Patient 2

M.S., 58 year-old man who had squamous cell carcinoma of the upper lip. Shown in the picture



Pre-operative

Fig. 14. Squamous cell carcinoma of the naso-labial region.

Post-operative

(Fig. 14.) are the extent of the lesion involving almost the whole vertical extent of the upper lip, nasal tip, inferior portion of the alae, the columella and anterior cartilaginous septum. Line of resection in the normal margin is negative. The first stage of reconstruction was

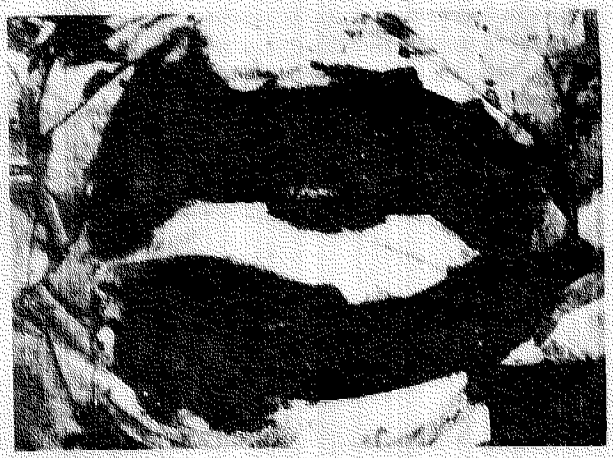


Fig. 15. Bipolar pedicle flap based to te superficial temporal vessels. This combines the forehead flap as the non-bearing hair flap as innertining andthe hair-bearing scalp flap which would serve as a moustache.

the upper lip using a bipolar pedicled flap based to the superficial temporal vessels.[12] The non-hair bearing flap was used as the inner lining and the hair bearing flap was used as the external cover which will serve as moustache to camouflage future scars. (Fig. 15) A cervical tubed flap was detached and reattached to the buccal musoca of the lower lip. Third stage, the other end of the tubed flap was detached and reattached to the nasal tip. At the same time, we did a bilateral nasolabial flap

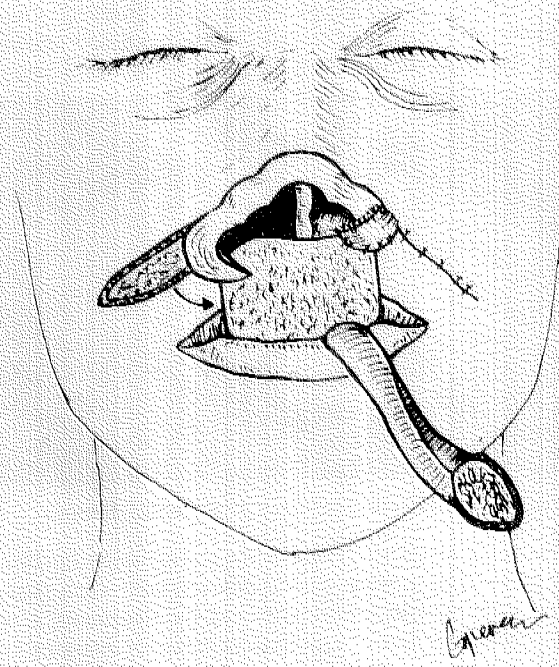
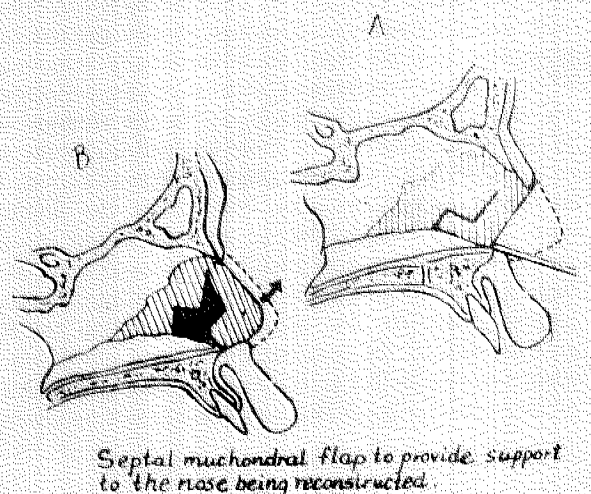


Fig. 16. Bilateral nasolabial flap to replace the excised inferior part of the alae.

to replace the excised inferior part of the alae. (Fig. 16) The last stage was the amputation of the cervical tubed



Septal muchondral flap to provide support to the nose being reconstructed.

Fig. 17. L-shape strut septal cartilage (according to Millard).

flap for the columella and tip correction. The anterior remaining septum was mobilized with an L-shaped strut for the attachment of the columella. (Fig. 17) In our experienc, this L-shaped strut septal cartilage as designed by Dr. Millar was not sufficient to support the nasal tip and as columellar framework even in a delayed procedure.[13] So, we have to reconstruct a more stable nasal tip and columella again with bone grafting and a columellar strut with bone.[14] The technique was described in the first case.

Patient 3

A.N., 69 year-old woman from Bontoc, still very active and planting rice who had a basal cell carcinoma at the nasal dorsum which started only as a pea-sized

Fig. 18. Basal cell carcinoma at the nasal dorsum.

lesion six years ago. (Fig. 8) She had refused surgery until it grew to its present size and it was only then that she was presented to our department for treatment. A wide excision was done with one centimeter margins from the normal tissue. Frozen sections were made on doubtful areas of resection like that one in the left medial canthus and inferior turbinate and turned out to be negative. Only the uppermost of the nasal cartilaginous septum close to the tumor was involved. The anterior tip of the inferior turbinate in the left was minimally penetrated by the tumor and so it was excised with adequate margins. Although grossly the left nasal bone was not involved, we intentionally removed it because of the involvement of the overlying periosteum. We also chipped off some bones in the anterior wall of the left maxilla because there was periosteal involvement as well. In the first stage of reconstruction, we harvested corticocancellous bone from the ilium to cover the left nasal bone to serve as a bed for our secondary bone grafting to lift the nose as soon as we had skin cover for the nose coming from our future forehead flap. We also placed bone graft to the left anterior wall of the maxilla. Our second move was to cover the skin defect to the nasal dorsum with the use of an island forehead flap which could not be covered

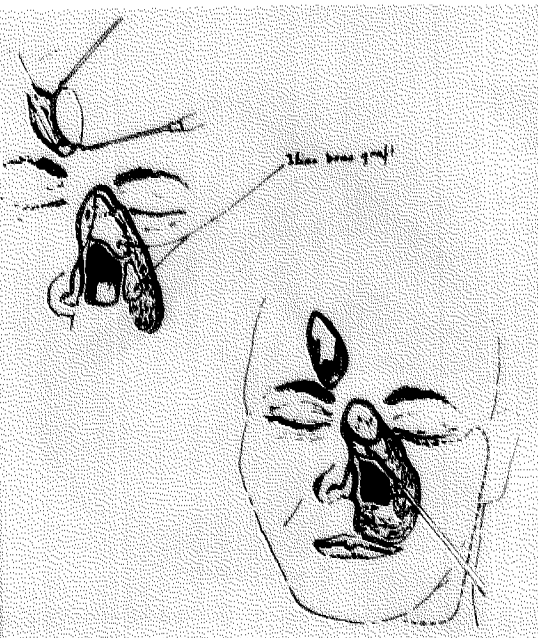


Fig. 19. Iliac bone graft to the left nasal dorsum. Island forehead flap was utilized to cover the bone graft.

by the Mustarde cheek flap. (Fig. 19) The donor site for this island flap was closed is a delayed manner. When the defect was already small we were able to close it primarily. The Mustarde cheek flap was devised to cover the excised portion of the left cheek because our future forehead flap would not be adequate to cover so

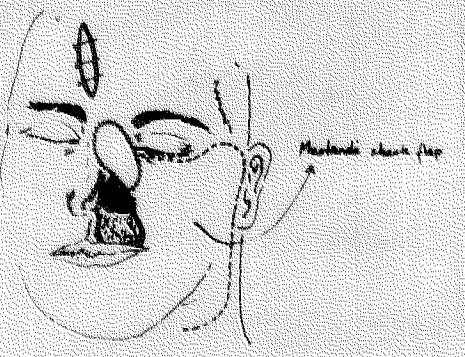


Fig. 20. Mustarde cheek flap to cover the excised portion of the left cheek.

large a defect. (Fig. 20) This at the same time would make our defect in the nose smaller and would serve as a base for our forehead flap to be designed. The defect in the left upper lip was repaired in a staged procedure using a modified Abbe-Estlander technique.[17] The left nasolacrimal duct was cannulated and a small polyethylene tube was retained and a new passageway from the conjunctiva was created. We were left with a smaller defect now with the use of a Converse scalp flap. (Fig.

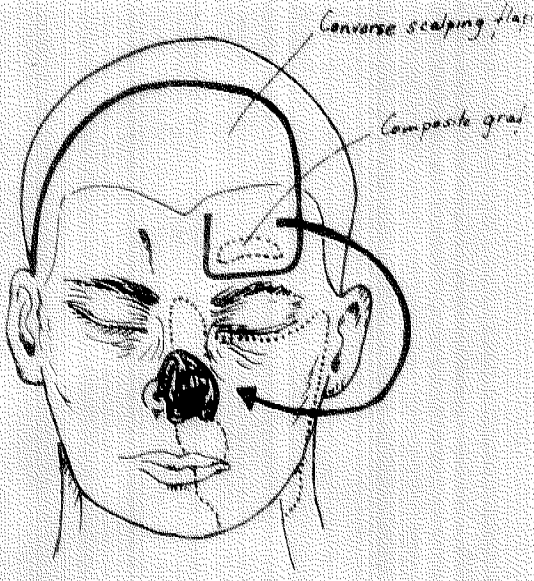


Fig. 21. Converse scalp flap.

21)[18-21] I chose this flap because we already had used an island flap and, also, part of the tumor in the region of the glabella and medial canthus were excised. This would have jeopardized the survival of a midline or Indian forehead flap. Another reason for using the Converse scalp flap is that our experience with complete horizontal forehead flap with a lateral pedicle requires an extra procedure to achieve a central position for the nose. If given all the chances I would prefer the Forehead Rhinoplasty because it is the most suitable donor site for the reconstruction of the nose and has the

ADVANTAGES OF FOREHEAD FLAPS

1. It results in excellent color and texture match.
2. It has a profuse blood supply.
3. Because the forehead flap can be transferred without delay, the period of hospitalization is shorter.
4. The use of the forehead flap obviates immobilization in uncomfortable positions.
5. The skin of the forehead is stiff, precluding the need for support.

Fig. 22. Advantages of forehead flaps.

following advantages viz a viz the arm flap. (Fig. 22) Its main disadvantage is scarring of the forehead. It also produces pigmentation and can not be used if the patient has a very narrow forehead. In the second stage we raised the distal part of the Converse forehead scalp flap.[19] We then implanted a composite graft (skin and conchal cartilage) underneath the raised part of the flap to serve as a framework and inner lining of the future left

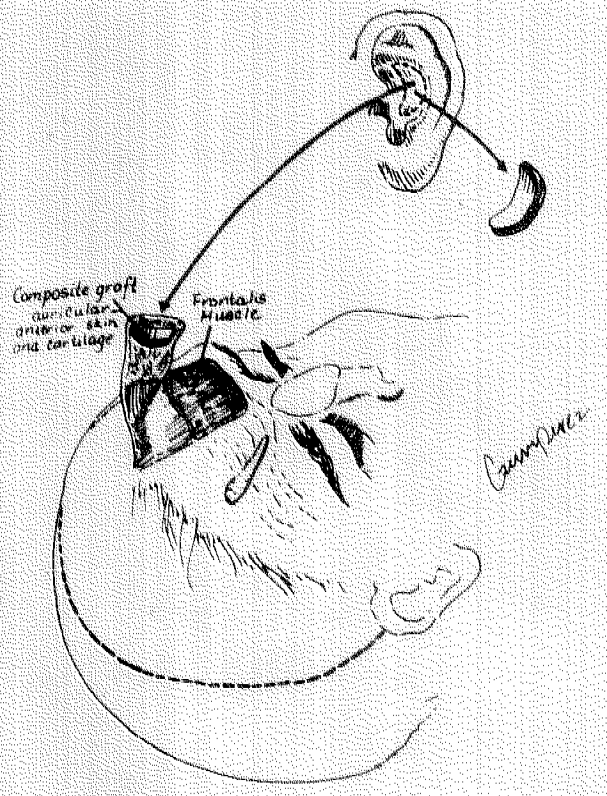


Fig. 23. Composite graft implanted underneath the raised part of the forehead scalp flap.

ala. (Fig. 23) At this point we also did the 2nd stage procedure of the upper lip reconstruction by detaching the lower lip attachment to the upper lip. The next

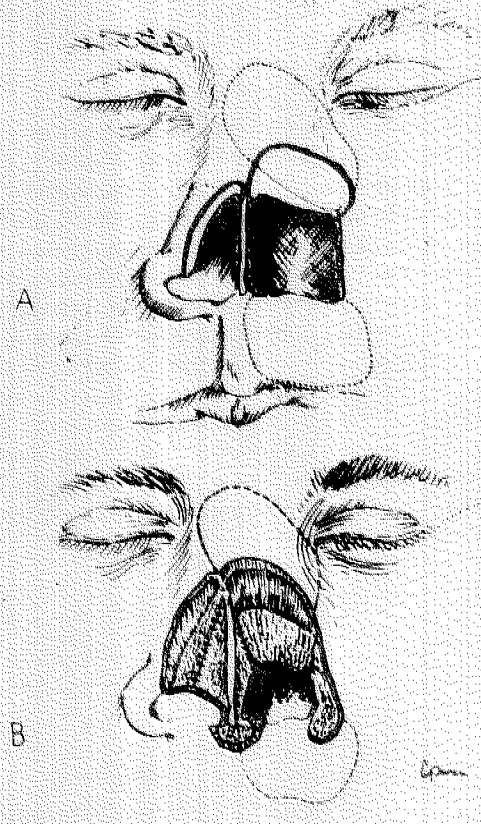


Fig. 24. Additional lining created for the nasal cavity. Composite graft being sutured to the nasal cavity lining which was previously implanted to forehead flap in a delayed procedure (fig. 23).

stage, additional lining for our nasal cavity was done. An allowance of nasal cavity defect was done for our composite graft previously implanted to the scalp flap. This was sutured to the surrounding tissue of the inner lining margin. After 3 weeks the flap was amputated and the remaining scalp pedicle was sutured back. We again placed a bone graft harvested from the ilium to lift the nose and nasal tip support and wired transnasally. A medial canthopexy was done to the left eyelid.[8] Succeeding stages were trimming, defatting to the nasal tip, columella and left ala as well as scar revision to the left upper and lower lip. Minor refinements should have been done here, such as lowering of the left ala but the patient had refused further surgery and was very much contented with the result. (Fig. 25)

Fig. 25. Final result

Comments and Discussion

Very few innovations have been reported since the time of Delpech, von Graefe, Carpue and Labat and almost none since the publication of the monumental work of Nelaton and Ombredanne. Outstanding surgeons have contributed ingenious refinements, but except for microsurgical free flaps, the basic rhinoplasty techniques remains the same. This combination of respiratory and olfactory functions of the nose cannot possibly be reproduced in major nasal reconstruction except when most of the nasal mucosa and skeletal support have been preserved, that is when only the skin covering of the nose has been lost. The skin and the skeletal support can be reconstructed but the transplanted tissue is always thicker than the original, limiting the airway to some extent. One has to consider a reconstruction successful when an acceptable air passage has been obtained. Cosmetic, wise it is difficult most of the time to achieve real fantastic aesthetic noses.

It is important to re-emphasize that no complications developed when the bone graft to the nose was the only procedure performed, and that the final results were all considered good or excellent. Resorption of bone grafts has always been argued as a reason to

utilize other materials for augmentation. Several factors are significant in preventing graft absorption. Solid fixation and wide contact with recipient bone allow neovascularization and solid union.[8,10] Bone grafts were isolated from direct contact with bone and subject to resorption. Neovascularization in dense cortical bone is limited. Intact periosteum may enhance graft survival. Silicon implants have been advocated in some series, and the reported incidence of complications has been low.[23,24] It has been our experience that the implants may have palpable and visible capsular margins occasionally associated with an erythematous hue, may be complicated by recurrent cellulitis, may migrate in position, or may erode and extrude either through skin or mucosa despite following all the rules advocated by some authors, e.g , not too large an implant, properly shaped implants to sit in the nasal bone and use of antibiotic and steroids for irrigation, etc. Silicone can be prefabricated, but with modern power-driven burrs, bone can be quickly and accurately contoured to match the defect. Taking of lican bone graft could be morbid to the patient if proper techniques are not followed. Pain in the iliac region on ambulation generally resolves wtihin 7 days with proper techniques applied. Bone can even withstand minor exposure. Minor exposure of silicone almost certainly results in extrusion especially in major nasal reconstruction. The autogenous bone grafts appear to be rapidly revascularized. Cartilage grafts for nasal augmentation also have met with success. Cartilage appears to survive by diffusion of nutrients, and resorption is uncommon, unless complicated by infection. Autogenous septal and conchal cartilage is preferred whenever possible. We use techniques outlined by Sheen.[28] In most cases, autogenous septal and conchal cartilage is excellent; however, when significant augmentation is sought and longitudinal pressure is exerted on the graft, such as in the post-traumatic foreshortened nose or severe saddle deformity, bone is preferred because the cartilage graft would undergo deformation, graft curvature or the warping phenomena. In conclusion, autogenous bone is the material of choice for major skeletal reconstruction of the nose.

At the present time, nasal mutilation is still a great problem to the patient and a most difficult challenge for the surgeon. It takes a lot of guts, perserverance, skill, aesthetic know-how and patience to rebuild a severely damaged nose.

References

1. Labat, L.. De la rhinoplastie, Paris, Imprimerie de Ducessois, 1834.
2. Antua, H.N.: Reconstructive Surgery for Nasal Defects, Clinics in Plastic Surgery, Vol. 8, No. 3, July 1981
3. Carpue, J.C.: An account of two successful operations for restoring a lost nose from the integuments of the forehead in the cases of two officers of His Majesty's Army, London, Longman, 1816.
4. Delpech, J.M.: Chirurgie Clinique de Montpellier, on observations et Reflexions Tirees des Travaux de Chirurgie de cette Ecole. Paris, Gabon et cie, 1823-1828.
5. Tagliacozzi, G.: De Curtorum Chirurgia per Institionen. Meiti 1597, Faccimilar edited by Ortiz-Monasterio, F. Mexico, 1972
6. Nelaton, C. and Ombredanne, L.: La Rhinoplastie. G. Steinhill, Paris, 1904.
7. Washio, H.: The retroauricular-temporal flap, Plastic and Reconstructive Surgery Journal, 43: 1969, p. 162.
8. Orticochea, M.: A new method for total reconstruction of the nose: The ears as donor areas, Clinics in Plastic Surgery, Vol. 8, No. 3, 481-505, July 1981.
9. Tessier, P.: Aesthetic aspects of bone grafting to the face, Clinics in Plastic Surgery — Vol. 8, No. 2, Apr. 1981, pp. 279-302.
10. Peer, L.A.: The fate of autogenous human bone grafts. British J. of Plast. Surg. 3:233, 1951.
11. Tipton, J.B.: Closure of large septal perforation with a labial buccal flap. Plast. Recons. Surg. 46:514-1515, 1970.
12. Wilson, J.S.P.: Personal Communication
13. Millard, D.R.: Total Reconstructive Rhinoplasty Plast. Reconst. Surg. 37:167, 1966.
14. Gillies, H.D. and Millard, D.R.: Inlay grafting. In Gillies and Millard: The principles and art of plastic surgery, Vol. 1, Boston, Little, Brown & Co. — 1975, p. 103.
15. Herbert, C.D.: A subcutaneous pedicled cheek flap for reconstruction of alar defects, British Journal of Plas. Surg., 31: 1971, pp. 79-92.
16. Mustarde, J.C.: Repair and reconstruction in the orbital region. London, Churchill Livingston, 1980.
17. Converse, J.M. (edit.): Plastic and reconstructive surgery, 2 edition, 1977.
18. Converse, J M.: Reconstruction of the nose by the scalping flap technique. Surg. Clin. North Am. 39:335, 1959.
19. Converse, J.M. and Casson, P.R.: Malignant tumors of the nose. In Converse, J.M. (ed.): Reconstructive Plastic Surg. Edition 2, Phila, W.B. Saunders, 1977.
20. Converse, J.M.: Clinical application of the scalping flap in reconstruction of the nose. Plast. Recons. Surg., 1969, pp. 43-247.
21. Vieira, C.R.: Reconstruction of the nose with malignant disease, Clinics in Plast. Surg., Vol. 8, No. 3, July 1981.
22. Graefe, C.F. von: Rhinoplastic, Berlin Realschulbuchhandlung, 1818.
23. Antia, N.H., Daver, B.: Prefabricated Silicone Nasal Implants, Plast. Recons. Surg. 52:264, 1973.
24. Hiraga, Y.: Complications of Augmentation Rhinoplasty in the Japanese, Annals of Plastic

Surg. Vol. 4, No. 6, June 1980, pp. 495-499.
25. Hiraga, Y.: Problems of augmentation rhinoplasty from the viewpoint of complications. Jpn L. Plast Reconstr. Surg. 18:4442, 1975.
26. Davis, P.K.B. et al: The complication of silastic implants, experience iwth 137 consecutive cases. Brt. J. Plast. Surg. 24: 405, 1971.
27. Lipshutz, H.: A clinical evaluation of subdermal and subcutaneous silicone implants. Plast. & Reconst. Surg. 37:249, 1966.
28. Sheen, J.H.: Aesthetic Rhinoplasty, St. Louis: Mosby, 1978.

The Phil.
Jour of Oto.
Head & Neck
Surgery

THE VALUE OF FROZEN SECTION DIAGNOSIS IN PAROTID TUMORS

Dr. Rodolfo B. dela Cruz*
Dr. Rodolfo P. Nonato*
Dr. Napoleon Ejercito**

INTRODUCTION

Frozen section diagnosis has been utilized by surgeons and pathologists for almost a hundred years. The skill and accuracy of this technique have improved during the intervening years. This frozen section diagnosis is now accepted as an integral tool in the diagnosis and management of diseases of various organs like the breast, thyroid and some others. The histologic diagnosis is often a problem in frozen section.

The objectives of our paper are the following:

1. To find out whether frozen section diagnosis in parotid lesions is a reliable guide for immediate decision regarding surgical therapy.
2. To determine the accuracy of frozen section in benign versus malignant lesions of the parotid.
3. To determine the frequent histopathological diagnosis of parotid tumos.

The decision to proceed with further surgery which may involve sacrifice of the facial nerve and radical neck dissection may depend upon the frozen section diagnosis. Pre-operative biopsy of salivary gland tumors is not advocated because of the danger of seeding of cancer cells. Frozen section diagnosis is also utilized in determining lines of resection. It is for these reasons why the authors have ventured on establishing the accuracy of this diagnostic tool. The accuracy is of course affected by various factors like competence of the surgeon and the pathologist.

METHOD AND MATERIAL

Records of 86 parotid specimens that had been removed and diagnosed at UP-PGH Medical Center of 1978, 1980, 1981 were included in this study. Of these reports, 36 underwent frozen section diagnosis. In all cases, the specimen submitted was a superficial lobectomy. The formal biopsy results were obtained from the pathology report, while the frozen section diagnosis was found either in the final written pathology report or in a special handwritten frozen section report by the pathologist who had then inserted it in the chart.

The results were divided into two categories, benign and malignant lesions on the basis of the formal biopsy report or permanent section diagnosis. Within these categories, the frozen section diagnosis was compared to the final biopsy report and placed under subcategories correct and wrong benign, and correct and wrong malignant diagnosis. The wrong frozen section diagnosis were compared with the permanent section diagnoses or final biopsy reports.

RESULTS

Table 1. Benign lesions

Permanent Section diagnosis	Frozen Section Diagnosis Correct	Wrong
1. Pleomorphic adenoma	20	0
2. Chronic parotitis	1	0
3. Parotid cyst	1	0
4. Lipoma	1	0
5. Oncocytoma	1	0
6. Warthin's tumor	1	0
7. Neurinoma	1	0
TOTAL	26	0

Of the 26 parotid tumors reviewed which underwent frozen section diagnosis, 26 were benign (table 1) and of these, 20 were pleomorphic adenomas, 2 were due to imflammatory disease (chronic parotitis and parotid cyst), 1 lipoma, 1 oncocytoma, 1 Warthin's tumor, and 1 neurinoma. Incidentally, a case of lymphocytic lymphoma was diagnosed as benign by frozen section. All of the 26 benign parotid tumors were diagnosed correctly as benign by frozen section, therefore 100%. Though the pathologists would not commit as to the definite histopathological diagnosis, but rather merely labelled it as benign. A benign lesion by permanent section diagnosis was never diagnosed as malignant by frozen section.

Table 2. Malignant lesions

Permanent Section diagnosis	Frozen Section Diagnosis Correct	Wrong
1. Mucoepidermoid CA	5	1
2. Adenocarcinoma	1	0
3. Adenoid cystic CA	0	1
4. Acinic cell CA	0	1
TOTAL	6	3

note: a case of lymphocytic lymphoma was diagnosed by frozen section as benign.

*Formerly Senior Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
**Professor, Dept. of Otolaryngology, UPCHM-PGH Health Sciences Center.

Only 9 of the 36 lesions studied (25%) proved to be malignant (table 2), and of these, 6 were mucoepidermoid CA, 1 adenocarcinoma, 1 adenocystic CA,and 1 acinic cell CA. The malignant tumor was accurately diagnosed by frozen section in 6 cases, and 3 were incorrectly diagnosed as benign. Therefore, if one are to consider the overall accuracy of frozen section for both benign and malignant parotid tumor it will be:

$$\text{benign } 87\% \left(\frac{26}{30}\right)$$

$$\text{malignant } 60\% \left(\frac{6}{10}\right)$$

Of the 86 parotid tumors seen in 1978, 1980, and 1981, 63 were benign and 23 were malignant as shown in table 3. Of the benign lesions, 42 were pleomorphic adenoma, which is more than onehalf of all the benign lesions. While of the malignant lesions, 12 were mucoepidermoid CA, which is about 50% of all the malignant lesions. By the way under indignant turns a 6 should be added o over cell CA.

Table 3

BENIGN TUMOR		MALIGNANT TUMOR	
Permanent Section diagnosis	NO.	Permanent Section Diagnosis	NO.
1. Pleomorphic adenoma	42	1. Mucoepidermoid CA	
2. Warthin's Tumor	3	a) Low grade	9
3. Reactive hyperplasia of parotid lymph node	3	b) High grade	3
4. Chronic parotitis	4	2. Adenocarcinoma	2
5. Parotid cyst	3	3. Adenoid cystic CA	3
6. Acinic cell adenoma	2	4. Squamous cell CA	2
7. Chronic granulomatous inflammation, caseation necrosis TB	2	5. Lymphocytic lymphoma	1
8. Lipoma	1	6. Acinic cell CA	1
9. Oncocytoma	1		
10. Neurinoma	1		
11. Hyperplastic adenoma with atypicality	1		
TOTAL	63		23

Table 4 will show the permanent section diagnosis and the corresponding wrong frozen section diagnosis. Acinic cell CA as cellular mixed tumor, Adenoid cystic CA as benign mixed tumor, mucopeidermoid CA and lymphocytic lymphoma as benign.

Table 4

Permanent Section Diagnosis	Wrong Frozen Section Diagnosis
1. Acinic cell CA	Cellular mixed tumor
2. Adenoid cystic CA	Benign mixed tumor
3. Mucoepidermoid CA	Benign
4. Lymphocytic lymphoma	Benign

DISCUSSION

One indication that has lead the authors to go into this frozen section diagnosis study is the immediate need to decide on the type of surgery, especially during instances wherein you are almost convinced of the diagnosis and all you need is another evidence that will push you to make the final surgical decision. This is very true for parotid tumors, some surgeries of which are quite deforming. For a benign mixed tumor, a superficial parotidectomy may be adequate therapy. If mucoepidermoid CA is encountered, the problem becomes more complicated in as much as the procedure may be modified according to the differentiation of the tumor, for example low grade mucoepidermoid may be treated by superficial parotidectomy, whereas high grade lesion may require total parotidectomy. In case of adenoid cystic CA which tends to invade nerves via the perineural lymphatics, sacrifice of the facial nerve may be required.

The frozen section diagnosis we obtained for benign lesions appear to be 87% accurate. In reports done abroad, the accuracy of frozen section in benign lesions ranges from 92 to 98 percent. This involved huge number of specimens. The result for malignant lesions was considerably less reliable, only 60%. We have to state here that most of the frozen section diagnoses were mostly only stated as benign or malignant. The pathologist would not commit as to the histopathology. Nevertheless, such diagnosis of benign or malignant is of great help to the surgeon.

In this study, one will see the difficulty that is encountered by the pathologists in low grade mucoepidermoid CA and lymphoma, in fact these are the lesions where the pathologists wrongly diganosed it as benign by frozen section. In the case of salivary gland tumors, or elsewhere, and occasional false-negative diagnosis of cancer is unavoidable, but false-positive dignosis should be a rare and vanishing phenomenon.

Please take note that in benign lesions, the pathologists never made an error in the frozen section diagnosis. However, in malignant lesions, the pathologists made only 60% correct diagnoses. From here we can surmise that the human factor plays a great role, wherein the pathologists tend to err on the benign side rather than on the malignan side.

This study is retrospective. Nevertheless, this study has emphasized several salient points. First, the unsatisfactory results of frozen section diagnosis in malignant salivary gland tumors. The surgeon must consider the validity of a frozen section diagnosis before embarking on exntesive, deforming surgery. The overall result for benign lesions is satisfactory. However, the surgeon must emphasize to the patient and family when a benign frozen section diagnosis has been made because it may be necessary to recall the patient later for a more extensive resection.

Secondly, the surgeon should assume an active role in evaluating the frozen section diagnosis. He correlates this with his gross finding of the parotid tumor in the operating room,as well as,with the history and associated signs and symptoms before determining the immediate surgical therapy.

Finally, if there is any doubt on the part of the pathologist regarding the frozen section diagnosis, and the surgeon has some doubts himself, then the surgeon should be conservative or proceed no further in his surgical management and await the formal biopsy result.

BIBLIOGRAPHY

Calcatera, Thomas and Paglia, Donald: Accuracy of

Frozen Section Diagnosis of Parotid Lesions. Annals of Otolaryngology. 88. 1979.

Holaday W.J., Assor D.: Ten Thousand consecutive frozen sections American J. Clinical Pathology 61:769 777, 1974.

Saltzstein S.L., Nahum, A.M.: Frozen Section Diagnosis: Accuracy and errors; user and abuser. Laryngoroge 83. 1128-1143, 1973.

Snow, James: Controversy in Otolaryngology. W.B. Saunders Co., Philadelphia, 1980.

Stell P.M., Maran A.G.; head and Neck Surgery. William Heinemaun Medical Books Ltd, London, 1977.

The Phil.
Jour of Oto.
Head & Neck
Surgery

SPEECH EVALUATION OF AMATSU SHUNT SPEAKERS

Joselito Jamir, M.D.*

I. Introduction

Until about a decade ago, clinicians had always feared carcinoma as one requiring medical and aggressive treatment to cure the disease. In the process, most clinicians are left with a surviving patient who is psychologically and emotionally depressed as a result of the treatment. This is specially true of head and neck cancers wherein a disfiguring operation has been the mainstay of surgical treatment. However, in recent years, there has been a drastic change in the attitude of physicians. There is now more concern with the quality of life after treatment rather than just an emphasis on the prolongation of life.

Surgery for carcinoma of the larynx is one of those fields wherein this dramatic shift has occurred. Emphasis is now placed not only on the extirpation of the malignancy but also on the conservation or restoration of speech of the patient. This is evidenced by the abundance of literature and new techniques on conservation laryngectomy.

Whenever a new surgical procedure is proposed, it is important to define the rationale for the procedure and verify the supposed advantages over the standard approach. If such a new operation is not truly based on anatomic, physiologic and/or pathologic facts and does anatomic, physiologic and/or pathologic facts and does not offer any substantial advantages, then there is no reason to advocate changing from the standard approach.

With those views in mind, the speech obtained following the Amatsu technique has been evaluated and analyzed according to quantitative and qualitative parameters.

II. Materials and Method

A total of 17 patients who had undergone the Amatsu trachoe-esophageal shunt were subjected to various tests and procedures. The patients were divided into two groups i.e., those who underwent operation at least a year before testing and those who were operated (on at least 3 months prior to testing but) not more than 6 months at the time of testing. The latter was further subdivided into 2 groups due to variance in test procedures and duration after operation. Three normal speakers of the same age range or the test groups were included to serve as control.

The general data of these group of patients can be seen in Table I. This summarizes the TNM classification, age at operation, sex and the clinician's subjective evaluation of speech intelligibility based on the criteria used by Leipzig20 et al.

Table II shows the different parameters used in evaluating and analyzing the voice obtained following the shunt operation.

A. Quantitative Measures

1. Sustained vowel duration: The patients were requested to phonate the vowel A and the duration (in seconds) he can sustain such sound were recorded.
2. Counting per breath: Patients were asked to count from 1-10 and repeat it as many times as he can in just one breath.
3. Syllables per breath: Patients were asked to recite the alphabet.
4. Words per breath: Patients were instructed to read from a list of two-syllable words specially drawn up by the researchers for this purpose.

The tests were done with three to four patients alternately at one sitting. Hence, there was essentially no prolonged rest period interval between tests. The gap between tests is less than a minute or to be more precise, just two to three breaths as the case may be.

Three trials were taken on all these parameters and subsequently recorded. However, only the best trial for each patient was taken into account in the subsequent computations. Each subject showed fairly consistent results in this aspect of the study.

5. Words per minute: This was computed from reading certain key sentences in the text used in the tape recorded portions of the examination.

B. Qualitative Measures

1. Level of intelligibility: Patients were made to read some paragraph from a standard textbook.

During the above procedure, the subject's voices were recorded using a song tape recorder. The results were recorded as percentages of the correct numbers of syllables or words as perceived by the listener-judges over the total number of test syllables or words as the case may be.

*Asst. Professor, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center

The listener-judges were made up of resident doctors and medical students. Furthermore, several sets of text were used to minimize familiarity on the part of the listener-judges. The judges were also unaware who the normal speakers were and those who had an operation. All these safeguards were undertaken to provide as objective an assessment of the recorded voices.

2. Adequacy: From the recorded portions of the test procedure, the number of pauses of the test groups as well as those of the control group were determined and compared. The same was done regarding the duration of time it required all groups to finish reading the text. Index of inadequacy was then computed as a percentage using the following formula:

$$\text{Inadequacy Index} = \frac{\text{No. of pauses (S)} - \text{No. of pauses (C)}}{\text{No. of pauses(C)}} \times 100$$

$$\text{II} = \frac{\text{Time required(S)} - \text{Time required(C)}}{\text{Time required (C)}} \times 100$$

III. Results and Discussion

Table IV shows the quantitative results of the speech evaluation. Group B-2 patients have markedly lower values than group A or group B-1. These data show a tendency or trend that somehow duration after the operation is a factor that has to be evaluated too. This points out the possibility that speech proficiency is directly related to the duration after the operation. Although patients can speak quite well after the removal of the catheter required to keep the shunt patent shortly after the operation, the patients still do need time to adjust well to the new form or mode of speaking to obtain maximum efficiency. Our limited number of subjects and the presence of overlapping values, however, prevent us from making such an assertion. This possibility needs further study in this matter.

Subject 3 of test group B-1, although underwent essentially a tracheo-esophageal shunt operation, has a different location of the shunt. Unlike the other subjects, this patient had his shunt situated in a lateral position and not in the center as in the usual procedure. This slight variation in the surgical technique may account for the seemingly poor results in comparison with the other subjects. This patient has to generate greater pressure to keep the shunt patent during phonation. Thus, he has to make more pauses and requires more time in comparison with the other subjects as well as with the control. However, in table V, all the subjects, irrespective of the group, have a high intelligibility rating save for subject 3 of group B-2. This patient has just been operated on a few weeks ago and has not really adjusted to his newly acquired speech.

Generally and collectively, the Amatsu shunt speakers compare favorably with both the control group and the results obtained by other researchers for normal speakers (Table VI). However, they were observed to be unable to pronounce the consonant H in combination with any of the vowels. All test groups committed this error thus raising the possibility that the sound production of the consonant H is forever lost among the Amatsu shunt speakers. It has been postulated by Koike et al[13] that this may be a function of the larynx as an articulator.

A study of the inadequacy index would tend to confirm our hypothesis as evidenced by the results in group A. These patients have become so used to their speech and have really developed it to such an extent that five patients have no inadequacy whatsoever and two patients have only partial inadequacy. Subject 2 of B-1 and subject 2 of B-3 have apparently adopted quite well and rapidly. However, these two patients had strong motivations to reacquire speech. We feel that patient's motivation does play a great role in the development of shunt speech.

Anotehr variable that has to be considered is the patient's vital lung capacity. The procedure after all requires the diversion of pulmonary air to the esophagus. Subject 2 of group B-2 is an athletic type and has good pulmonary function whereas subject 3 of group B-2 is of the sedentary type.

In comparison with the results obtained by other researchers (Table VI),[4,6,14-19] the Amatsu shunt shows that all test groups are definitely better than those of the esophageal speakers. It also compares favorably well with the results obtained from other rehabilitative procedures that are commonly being used now.

Although no pre-selection of subjects were carried out, Leipzig's subjective criteria tend to place all the subjects classified as grade I except for one subject. The results obtained using the objective assessment methods showed that although all groups do have excellent conversational ability, phonetic assessment showed that there is still room for improvement regarding tracheo-esophageal shunt speakers as well as intrinsic defects (the inability to pronounce H when used in combination with any of the five vowels).

Although our results tend to show that tracheo-esophageal shunt speakers are better than other alaryngeal forms of speech, we hesitate to make that conclusion because of the limited number of subjects involved that precludes any statistical test of reliability. Furthermore, allowances should be given for possible differences in test measures, patient's physical fitness, motivations, practice and family encouragement and support.

IV. Conclusions

The Amatsu shunt speakers apparently have good results as far as quantitative and qualitative parameters used in this study are concerned.

Although the Amatsu technique can be done to all cancers of the larynx requiring surgical management, individual variables like motivation, physical condition, pulmonary function, family concern and cooperation have to be considered. However, in group B-2 patients the procedure was done without any consideration to these individual variables.

Summary

A group of 17 patients were subjected to a variety of test measures to determine the quantity and quality of voice produced following Amatsu's technique of rehabilitation procedure for laryngectomies. The parameters used were sustained duration of the prolonged vowel, counting per breath, syllables per breath, words per breath, words per minute, level of intelligibility, adequacy of voice produced.

The results obtained were remarkably better than those of esophageal speakers and closely approximates the normal voice. Furthermore, the advantages over other procedures were enumerated.

TABLE I

		Sex	Tumor Site	TNM	Age at Operation	Intelligibility
Test Group A						
Subject	1	M	Supraglottic	$T_4N_1M_0$	62	Excellent
	2	M	Glottic	$T_1N_0M_0$	61	Excellent
	3	M	Glottic	$T_2N_0M_0$	47	Excellent
	4	M	Supraglottic	$T_2N_0M_0$	55	Excellent
	5	M	Supraglottic	$T_2N_0M_0$	56	Excellent
	6	M	Glottic	$T_3N_0M_0$	49	Excellent
	7	M	Glottic	$T_3N_2M_0$	64	Excellent
	8	M	Supraglottic	$T_4N_1M_0$	63	Excellent
	9	M	Glottic	$T_3N_0M_0$	64	Excellent
	10	M	Glottic	$T_2N_0M_0$	69	Excellent
	11	M	Supraglottic	$T_3N_1M_0$	63	Excellent
Test Group B-1						
Subject	1	M	Glottic	$T_3N_0M_0$	56	Excellent
	2	M	Glottic	$T_1N_0M_0$	69	Excellent
	3	M	Subglottic	$T_3N_0M_0$	66	Excellent
Test Group B-2						
Subject	1	F	Glottic	$T_3N_0M_0$	42	Excellent
	2	M	Glottic	$T_3N_0M_0$	47	Excellent
	3	M	Glottic	$T_3N_1M_0$	55	Communicates primarily with voice.

TABLE II

Objective Evaluation of Speech

I. Quantitative Parameters
   - A. Duration of sustained vowel
   - B. Counting per breath
   - C. Words per breath
   - D. Syllables per breath
   - E. Words per minute

II. Qualitative Measures
   - A. Intelligibility
   - B. Adequacy

BA	YI	SU	NGE	LO
GU	BE	YO	SA	NGI
MO	GA	BI	YU	SE
PI	MU	GE	BO	YA
TE	PO	MA	GI	BU
KA	TI	PU	ME	GO
HU	KE	TO	PA	MI
NO	HA	KI	TU	PE
RI	NU	HE	KO	TA
WE	RO	NA	HI	KU
DA	WI	RU	NE	HO
LU	DE	WO	RA	NI
NGO	LA	DI	WU	RE
SI	NGU	LE	DO	WA
YE	SO	NGA	LI	DU
ASO	ISLA	NGUNIT	RILES	GULONG
DAMPA	AKO	ILAN	TAO	PAYONG
MANOK	DUKOT	APOY	INOM	SALAT
PINTO	NAYON	GABI	BABOY	TUWA
RELO	UKOL	PAWIS	GABAY	BATA
SULAT	YAGIT	WALIS	ULAN	DAHON
WALA	TANONG	SAWI	KUBO	HIRAM
YARI	OKRA	KALAN	HAPAG	LASA
ULAM	KAHOY	HAPON	LANGIT	NGONGO
BAKA	HIYA	LUHA	MULAT	NATIN

TABLE IV. QUANTITATIVE MEASURES OF SPEECH

SUBJECTS	GROUP A											GROUP B-1			GROUP B-2		
PARAMETERS	1	2	3	4	5	6	7	8	9	10	11	1	2	3	1	2	3
1. Sustained vowel Duration (Sec.)	22	10	23	15	16	30	12	9	8	6	28	9	17	10	4	8	5
2. Counting per Breath	60	60	110	110	106	70	50	50	12	21	80	45	60	39	11	40	30
3. Syllables per Breath	85	25	180	105	100	101	50	46	25	24	50	45	70	28	21	38	6
4. Words per Breath	30	35	50	19	32	36	18	31	24	16	16	16	23	13	7	29	6
5. Words per Minute	96	221	123	271	135	193	124	211	157	132	97	106	151	95	55	148	46

TABLE V. QUALITATIVE MEASURES

SUBJECTS	GROUP A											GROUP B-1			GROUP B-2		
PARAMETERS	1	2	3	4	5	6	7	8	9	10	11	1	2	3	1	2	3
1. Level of Intelligibility	98.68	100	98.79	100	99.63	98.33	98.06	97.35	98.33	100	100	100	98.90	100	100	100	53
2. Adequacy a) No. of Pauses	36	26	35	15	30	15	28	21	12	26	28	30	13	57	26	14	32
b) Time Required (Sec.)	123.8	88.32	118.96	67	123.28	76.16	104.61	95.26	87.68	111.45	111.45	176.94	135.19	166.63	105.71	85.64	105.73
3. Inadequacy Index a) Pauses	38.46	30	75	--	20		40		--		12	15.38	--	119.23	100	--	113.33
b) Time	-	--	26.74	-	1.48	--	11.67	-	-	--	45.65	2.7	--	26.62	148.26	73.64	141.23

TABLE VI

Comparison of Control VS Test Group

A.	Intelligibility (%)	Control	Group A	Group B-1	Group B-2
	1. Set A	100	98.70		
	2. Set B	100	98.93		
	3. Set C	100	99.34	100	
	4. Set D	100	100	98.90	
	5. Set E	100			100
	6. Set F	100			100
	7. Set G	100			52.63
B.	Adequacy				
	1. No. of Pauses				
	a. Set A	20	21		
	b. Set B	25	26		
	c. Set C	26	31	44	
	d. Set D	20	26	13	
	e. Set E	13			26
	f. Set F	14			14
	g. Set G	15			32
	2. Reading Time (sec.)				
	a. Set A	93.86	90.88		
	b. Set B	121.48	130.93		
	c. Set C	131.60	117.62	150.90	
	d. Set D	103.60	88.32	90.42	
	e. Set E	42.58			105.71
	f. Set F	49.32			85.64
	g. Set G	43.83			105.73

REFERENCES

1. Snidecor, J.C.. Some Scientific Foundations for Voice Restoration. Laryngoscope, 85 (4): pp. 640-647, April 1975.
2. Amatsu, M. et al. Vocal Rehabilitation After Total Laryngectomy. A New One Stage Surgical Technique. Journal Otolaryngologic Japnica. 80.779-785, 1977.
3. Asai, R. Asai's New Voice Production Method: Substitute for Human Speech. Proceedings of VIII International Congress of Otorhinolaryngology, Tokyo p. 730, 1965.
4. Sheed, D. et al, Reed Fistula Method of Speech Rehabilitation After Laryngectomy, Americal Journal of Surgery, 124.510-524, 1972.
5. Calcaterra TC, Jafek VW. Tracheo Esophageal Shunt for Speech Rehabilitation After Total Laryngectomy. Archives of Otolaryngology 94. 124-128, 1971.
6. Komorn RM. Vocal Rehabilitation in the Laryngectomized Patient with a Tracheo-esophageal Shunt. Annals of Otology, Rhinology and Laryngology 83.445-451, 1974.
7. Arslan, M. Reconstructive Laryngectomy. Annals of Otology, Rhinology and Laryngology, 81. 479-487. 1972.
8. Staffieri Nand Serafini K. La Rehabilitazione Chirurgica della Voce e della Respiratione dopo Laryngectomia Totale ATTI del XXIX Congress Nationale, Associazone Otologi Aspedalieri Italian, Bologna, 28 Septembre - 3 Octobere, 1975.
9. Taub, S and Bergner, L.H Air Bypass Voice Prosthesis for Vocal Rehabilitation of Laryngectomees. American Journal of Surgery, 125.748-756, 1973.
10. Iwai, H and Koike, Y. Primary Laryngoplasty, Archives of Oto-Rhino-Laryngology, 206.1-10, 1973.
11. Singer MI, Blom ED. An. Endoscopic Technique for Rehabilitation of Voice After Laryngectomy, Annals of Otology, Rhinology and Laryngology, 89(6).529-533, Nov-Dec, 1980.
12. Gussenbauer, C. Uber die Ersfe Durch Th. Billoroth an Menochen ausgefuhrte Reblkopf Exstirpation, and Arwendung eines Rustbichen Reblkopfes. Verk. Sfsch. Ises. Chir. 1.250, 1874.
13. Koike Y. Iwai H. Morimoto H. Restoration of Voice After Laryngeal Surgeries. Laryngoscope 85(4). 656-665, Aplil, 1975.
14. Snidecor J.C. Speech Rehabilitation of the Laryngectomized, Springfield. Ill., Charles Thomas, 1962 p. 77.
15. Weinberg B., Riekena A., Speech Produced with the Tokyo Larynx, Journal of Speech and Hearing Disorders 38(3). 383-389, August, 1973.
16. Weinberg, Shedd D., Horii Y., Reed Fistula Speech Following Pharyngolaryngectomy. Journal of Speech and Hearing Disorders 43(3). 401-413, 1978.
17. Zwitman, DH. Calcaterra TC. Phonation Using TE Shunt After Laryngectomy. Journal of Speech and Hearing Disorders 38(3). 369-373, August, 1973.
18. Beukelmann DR., Cummings CW, Dobie RA, Weymuller, Jr. EA. Objective Assessment of Laryngectomized Patients with Surgical Reconstruction, Archives of Otolaryngology 106(11). 715-718, November, 1980.
19. Wetmore SJ, Krueger K, Wesson K. Singer – Blom Rehabilitation Procedure Laryngoscope 91(7). 1109-1117, July, 1981.
20. Leipzig, B., Neoglottic Reconstruction Following Total Laryngectomy: A Reappraisal. Annals of Otology, Rhinology and Laryngology 89(6 Part 1). 534-537, November, December, 1980.

The Phil.
Jour of Oto
Head & Neck
Surgery

SURGICAL MANAGEMENT OF NASOPHARYNGEAL ANGIOFIBROMA WITH PTERYGOID FOSSA EXTENSION

Dr. Mariano Caparas*
Dr. Teodoro Jardeleza**
Dr. Jaime F. Flor***

Juvenile angiofibroma is a highly vascular tumor found in the nasopharynx of adolescent males. It is histologically benign but clinically malignant in that it has the capacity for local destructive growth and and fatal hemorrhage.

It is not an uncommon tumor. The Department of Otolaryngology, Philippine General Hospital has seen and treated a total of 50 cases in a six-year period, from 1973 to 1798 An average of 8 cases are seen annually and they comprise 1.4% of the total annual admissions of the department.

Because of the aggressive behavior and invasiveness of the tumor, the otolaryngologist and head and neck surgeon may encounter the following pitfalls in the management of these cases:

1. Failure to determine pre-operatively the extent of the tumor.
2. Extreme vascularity of the tumor flooding the operative field
3. Confined surgical field with inadequate space for instrumentation.
4. Capacity to spread to contiguous areas from the nasopharynx to the sinuses, pterygoid plates, infratemporal fossa, orbital and intracranially.

In determining the extent of the tumor, the following diagnostic aids may be of help:

1 Plain skull films
   a. This will show the mass density in the nasopharynx.
   b. It will not completely show the tumor extent.
   c. Secondary sinusitis may obscure the radiologic picture.

2. Coronal Polytomography
   a. It will reveal tumor extens ion.
   b. It will show bone erosion unsuspected in the clinical examination and plain films.

3. Carotid angiography
   a. Delineates the anatomic location of the mass.
   b. Helps demonstrate extension into the surrounding areas.
   c. Shows the sources of blood supply.
   d. Shows a vascular pattern which is diagnostic, thus avoiding biopsy which could be associated with severe bleeding.[2]
   e. For follow-up evaluation of residual tumor.

Carotid angiography is not done routinely by the department. Its indications are:

1. Evidence of extension outside the nasopharynx.
2. Suspicion of intracranial extension.

4. CATSCAN

The unusual character and pitfalls have contributed to the high recurrence rate. The department has formulated and developed and adhered to the following surgical principles in managing these tumors:

I – Decrease the vascularity
   A – Hormonal Therapy
      1. Use of adjunctive and not definitive therapy.
      2. Diethylstibestrol 5 mg TID for 4-8 weeks.
         a. Stimulates the process of fibrosis and collagen deposition.
         b. Decreases the vascular bed
         c. Matures and solidifies the tumor for handling during surgery.
   B – External carotid artery or internal maxillary artery ligation.
   C – Individual ligation of all identifiable blood vessels.

II – Good exposure resulting in good visualization of the nasopharynx.

III – Adequate space for instrumentation.

IV – Avoid excessive bone destruction or functional disability undesirable in young patients.

V – No alteration of the physiology of the nasal cavity.

VI – Do not interfere with the development of

*Professor and Chairman, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
**Consultant in Otolaryngology, Jardeleza EENT Clinic, Joilo City.
***Chairman, Dept. of Otolaryngoloy, Fatima Medical Science Foundation, Inc.

the facial skeleton in juveniles.

VII -- Versatility of the surgical approach so that added procedures to gain better exposure will not result in increased morbidity and disfigurement.

VIII -- Adequate mobilization of the tumor and all its extensions.

These surgical principles and considerations have given rise to a number of surgical approaches designed to remove th4se tumors completely. They vary from a trapdoor bony palatal flap to a transpharyngeal approach. Only the most accepted approaches will be considered.

I – Transpalatal approach

A -- T-shaped incision

1. Gives relatively poor exposure.
2. Limited area for instrumentation.
3. Results in a straight scar which contracts and shortens the palate postoperatively.
4. Poor healing following previous surgery or irradiation.

II – Inverted U-shaped incision

1. Offsets the disadvantages mentioned above.
2. For tumors confined to teh nasopharynx.
3. For extensions to be sphenoid sinus and posterior choana.
4. Insures complete repair and normal function of the palate after surgery.
5. Not practical for tumors more than 5 cm.

III – Transpalatal combined with a lateral rhinotomy

1. For tumors originating in the nasopharynx with anterior extension to the nasal cavity.
2. The lateral rhinotomy portion is of questionable necessity.

IV – Retromaxillary – The transpalatal incision is carried around the maxillary tuberosity into the gingivo-buccal sulcus.[12]

1. For tumors with lateral extension in contiguity with the nasopharynx.
2. Gives unsurpassed exposure and allows exploration of the pterygoid plates and pterygo-maxillary space.
3. Not adequate for recurrent tumors or large virgin tumors in the pterygo-maxillary fossa.[2]

V – Transmaxillary or extended Caldwell-Luc approach[5,2,16]

1. For exposure of tumors residing in the more anterior part of the nasal cavity or ethmoid sinuses.
2. Facilitates occasional transantral ligation of the internal maxillary artery.
3. We have not found much indication for this exposure because by itself it fails to expose the nasopharynx adequately.

VI – Combined Trnaspalatal, Transmaxillary, Retromaxillary and Weber-Ferguson Incision

1. Gives good exposure to all contiguous areas the tumor could invade (except of course intracranially).
2. Better exposure to the maxillary antrum and retroantral space.
3. Can identify and ligate the internal maxillary artery.
4. Allows exploration of the infratemporal fossa and the retro-orbital space.
5. May case mutilation of the facial skeleton and some degree of disfigurement.
6. This is the surgical approach we favor for nasopharyngeal tumors with massive extension into the pterygoid and infratemporal fossa.

We would like to present five cases representative of our experience of juvenile angiofibroma with pterygo-maxillary extension.

All patients were male with an average age of 20 years and a mean duration of symptoms of 14 months. Sixty percent were recurrent and were probably due to residual tumor undetected outside the nasopharynx.

All patients came in with the classical symptoms of epistaxis and nasal obstruction. For large tumor extensions in the pterygo-maxillary area or the orbit, the patient is seen with swelling of the cheek or proptosis. There is associated visual impairment due to pressure or traction of the optic nerve.

Small pterygoid fossa extension may not show proptosis and swelling of the cheek and remain undetecteds clinically. This can be verified by carotid angiography or by exploration of the pterygoid fossa during surgery. Here we would like to emphasize the importance of the versatility of the surgical approach which will allow visualization and exploration of contiguous areas without added morbidity.

Plain films were used routinely. Carotid angiography was done selectively.

Treatment was combined pre-op estrogen therapy and surgery. The first 2 cases had an initial transpalatal incision. When the tumor was found to have invaded the pterygoid fossa, the incision was carried around the maxillary tuberosity to the gingivolabial sulcus. Cases with small pterygoid extension could be freed by blunt and sharp dissection and the extension pushed with a finger to the nasopharynx.

For patients with clinical evidence of extensive involvement outside the nasopharynx, we plan our surgery well. We have enough available, do a tracheos-

tomy for undiction of anesthesia and leave the operating field free of any obstruction as well as for a secured airway post-operatively.

We do a transpalatal, retromaxillary and transmaxillary incision and determine the extent of the pterygo-maxillary extension. Dumbbell-shaped tumors are difficult to remove en bloc. These hourglass tumors have to be removed in two pieces. We remove the nasopharyngeal mass initially, pack the nasopharynx and attempt to mobilize the pterymaxillary extension through the transmaxillary incision. If we encounter any difficulty we proceed to a Weber-Ferguson Longaire incision. We follow this sequence instead of doing all the incisions before attempting removal because we are reluctant to do incisions which would leave a visible scar unless absolutely indicated.

CONCLUSION

Extensive juvenile angiofibroma is always a surgical problem as well as a surgical challenge and we feel that a combined surgical approach is mandatory. Wide exposure of the tumor using the appropriate surgical appraoch gives a better surgical advantage and reduces the recurrence rate.

In juvenile angiofibroma with pterygomaxillary extension, the surgeon has to make a difficult choice between inadequate exposure or some form of deformity or mutilation. We feel, however, that in such an extensively invading tumor, the problem of mutilation or cosmetic deformity is secondary to the necessity of removing the tumor completely.

To end this paper, I would like to quote one of the men who has tackled such tumors.

"When the tumor has invaded neighboring regions, it has not only paved the way for its invasion, but also created a pathway for its surgical removal."

BIBLIOGRAPHY

1. Apostal, J.V. and Fragell, E.L.: Juvenile Angiofibroma. *Cancer*, 18:869-878, July, 1965.
2. Beller, H.F., et al: Angiofibroma: A Treatment Approach. *The laryngoscope, 84:895-706, 1974.*
   Approach. *The laryngoscope*, 84:895-706, 1974.
3. Briant, T.D.R., Fitzpatrick, P.J. and Book, H.: The Radiologic Treatment of Juvenile Angiofibrome. *Ann Otolaryngo L.*, 79:1108-1113, 1970.
4. Butler, R.M., Nahum, A.N., and Hanabel, W.: New Surgical Approach to Nasopharyngeal Angiofibroma. *Trans. Amer. Acad. of Ophthal. and Otolaryngol.*, 71:92-104, 1967.
5. Figi, F.A. and Davis, R.E.: Management of Nasopharyngeal Fibromas, *The Laryngoscope*, 60:794-814, 1950.
6. Herderson, G.P., Jr. and Patterson, C.N.: Further Experiences in Treatment of Juvenile Angioma. *The Laryngoscope*, 79:561-580, 1969.
7. Jafek, B., et al.: Surgical Treatment of Juvenile Angiofibroma. *The Laryngoscope*, 83:707-720, 1973.
8. Kremen, A.J. Surgical Management of Angiofibroma of the Nasopharynx. *Ann Surg.*, 138:672, Oct., 1953.
9. Patterson, C.N.: Juvenile Nasopharyngeal Angiofibroma. *Arch. Otol.*, 81:270-277, 1965.
10. Roberson, G.H., et al.: Pre-Surgical Internal Maxillary Artery Embolization in Juvenile Angiofibroma. *The Laryngoscope*, 82:1524-1532, 1972.
11. Sardano, D.S.: Nasopharyngeal Fibroma, Extension Into the Cheek. *Arch Otol.*, 81:584-588, 1965.
12. Schiff, M.: Juvenile Angiofibroma: A Theory of Pathogenesis. *The Laryngoscope*, 69:981-1016, 1959.
13. Walike, J.W. and Mackay, B.: Nasopharyngeal Angiofibroma: Light and Electron Microscopic Chanes After Stilbestrol Therapy. *The Laryngoscope*, 80:1109-1121, 1970.
14. Ward, P.H., et al.: Juvenile Angiofibroma: A More Rational Therapeutic Approach Based Upon Clinical and Experimental Evidnece. *The Laryngoscope*, 84:2181-2194, 1974.
15. Wilson, W. et al.: Juvenile Nasopharyngeal Angiofibroma. *The Laryngoscope*, 82:985-996, June, 1972.

SCIENTIFIC RESEARCH

PAPERS

IN

OTOLARYNGOLOGY

Presented on December 2, 1983
at the Top of the Hilton, Manila Hilton

Sponsor:
Medichem Pharmaceuticals, Inc.
(Division of United Latoratories, Inc.)

The Phil. Jour of Oto. Head & Neck Surgery

CHEMOTHERAPHY OF RECURRENT NASOPHARYNGEAL CARCINOMA WITH COMBINATIONS OF CISPLATIN + BLEOMYCIN VS. CISPLATIN + VP-16*

Fita Pascual-Guzman**

INTRODUCTION:

Nasopharyngeal Cancer is rare in most parts of the world with an age-adjusted incidence of less than 1/100,000.[1] It is of main significance to certain Oriental groups: Chinese, Malay, Indonesians, Vietnamese and Filipinos. Although the etiology remains unknown, this racial distribution suggests a genetic susceptibility to some environmental factors.

The Central Tumor Registry of the Philippines reported in 1977 the incidence of Nasopharyngeal Carcinoma for male and female was 31/100,000 and 13/100,000 respectively.[2] The UPCM-PGH Tumor Registry in 1981 listed 87 cases of Nasopharyngeal Carcinoma out of 1837 malignancies.[3] It is the 3rd most common malignancy in this institution.

Malignancy of the nasopharynx generally occurs during the 5th decade of life. It has 3:1 male preponderance. It usually originates from the lateral wall of the nasopharynx with a predilection for the fossa of Rosenmuller, followed by the vault of the nasopharynx. Nasopharyngeal carcinoma (NPCa) may spread superiorly or inferiorly by direct extension. NPCa has an 80-90% incidence of metastatic node disease on presentation.[4]

Megavoltage radiation therapy is the primary treatment for cancer of the nasopharynx.[5, 6, 7] Treatment fields cover all of the nasopharynx and adjacent skull base to the level of the sella turcica, and draining lympatics. When clinically positive cervical nodes are present, supplemental low anterior cervical field is employed including supraclavicular area and upper mediastinum. Although early lesions limited to the primary site has the higher rate of cure, advanced disease has a greater incidence of recurrence. The 2 most important causes of treatment failure are local recurrence and distant metastasis. Statistics from Western Europe indicate 26% rate with an average of 11 months for reappearance. Nodal recurrence amount to 31% while distant metastasis amount to 21%. The overall 5-year survival rate is 44-59%. These also apply to local ex- which will enhance symptomatic palliation and prolongation of a reasonable quality of life.

Several chemotherapeutic agents have been studied extensively either singly or in combination with extremely different responses. One of the more frequently used agents in head and neck cancer, Cisplatin, produced 72% response rate in 18 patients treated with monthly infusions of 80 mg/M2 (Jacobs et al) and a 50% regression of measurable tumor in 62.5% of patients treated on D1,and 8- month schedule. (Hong et al).

Studies using combination chemotherapy have indicated a high proportion of responses. Of the several combinations studied using 3-4 drug combinations, none seemes to have surpassed the efficacy of DDP + Bleomycin. Randolph et al of Memorial Sloan-Kettering Institute reported 71% response rate in 21 patients with unresectable previously untreated Head and Neck Cancers. Hong et al reported 8 complete and 22 partial responses in 39 previously untreated patients are receiving Bleomycin and Cisplatin. In chemotherapeutic trials of lung cancers, impressive synergistic activity were reported with VP-16 with Cisplatin. Even if the activity of VP-16 in Head and Neck Cancer has not been evaluated fully well, it is worth investigating whether VP-16 in combination with Cisplatin is less effective, as effective or superior in treatment of recurrent nasopharyngeal carcinoma compared to Cisplatin and Bleomycin.

OBJECTIVES:

1. To compare the initial response and duration of response of patients with recurrent NPCa following treatment with (a.) Cisplatin (DDP) + Bleomycin, (b.) Cisplatin + VP-16

2. To compare the qualitative and quantitative toxicites of the above 2 regimens.

MATERIALS & METHODS:

Treatment was randomized and controlled using Cisplatin based regimen combining with Bleomycin (Plan

*1st Prize

**Consultant in Otolaryngology, Children's Medical Center.

A) or VP-16 (Plan B) as systemic therapy in the treatment of NPCa.

Patients were included based on the following criteria:

1. Most have histologically proven NPCa with recurrence (local or distant) or progression after prior treatment with cytotoxic agents or radiotherapy.

2. May have received prior non-Cisplatin or Bleomycin or VP-16 containing chemotherapy but must have fully recovered from toxicities of treatment. If there was previous radiotherapy, a 2-week period is recommended before administration of chemotherapy on full dosage regimen. Chemotherapy maybe administered as soon as there is bone marrow recovery.

3. Must have life expectancy of at least 12 weeks.

4. Must have measurable lesions that can be evaluated for anti-tumor effects.

5. Must have a performance status of 40% (Karnofsky) or better. (See Appendix)

6. Must have adequate bone marrow function (defined as an absolute granulocyte count of 2,000 or more), adequate hepatic functions (defined as normal bilirubin and not greater than 50% increase in LDH, SGOT, and alkaline phosphatase) and adequate renal function (defined as a serum creatinine of 1.5 mg% or less.)

Those diagnosed with second malignancy, senility, psychoses, CNS diseases or other expected difficulties for follow up like active infection, severe malnutrition and patients with no consent for treatment were excluded.

A complete history and physical examination including documentation of all measurable disease as well as signs and symptoms were performed prior to the start of the study. Although all the patients under study received prior radiotherapy, the clinical staging of their disease was based upon the American Joint Committee for Cancer Staging and End Results Reporting (1976)

PRIMARY TUMOR (T)

T_1	–	tumor confined to one site of nasopharynx or no tumor visible (positive biopsy only).
T_2	–	tumor involving 2 sites of the nasopharynx
T_3	–	extension of tumor into nasal cavity or oropharynx
T_4	–	tumor invasion of skull and/or cranial nerve involvement

CERVICAL NODES (N)

N_0	–	no clinically positive node
N_1	–	single clinically positive homolateral node less than 3 cm
N_2	–	single clinically positive homolateral node 3 cm-6cm in diameter or multiple clinically positive homolateral nodes none over 6 cm in diameter.
N_3	–	massive homolateral node(s), bilateral nodes or contra-lateral node(s).

STAGING GROUPING

Stage I	$T_1N_0M_0$
Stage II	$T_{2N0}M_0$
Stage III	$T_4N_0M_0$, Any TN_2M_0, Any T, Any NM_1

Laboratory studies needed were CBC with differential and platelet counts, BUN, Creatinine, SGOT, SGPT, Alkaline Phosphatase, LDH, Calcium, Uric Acid, Glucose, Serum Electrolytes, Magnesium, Urinalysis, Creatinine Clearance, EKG, Chest and Paranasal Sinus X-rays. Radioisotope studies (brain, liver, Ct scan) and other X-rays were done when necessary.

Thirty five patients were randomly assigned to one of the following treatment aims. Patients who belonged to Group A were given Cisplatin 20 mg/M^2/day for 5 consecutive days, IV. Bleomycin was administered weekly 15 mg/M^2 throughout duration of therapy until a cumulative dose of 240 mg/M^2 throughout duration of therapy until a cumulative dose of 240 mg/M^2 IM is reached. Those patients in Group B were given Cisplatin for 5 consecutive days (1-5) at a dose of 20 mg/M^2/day IV. VP-16 was also given for 5 consecutive days (day 1-5) at daily dose of 60 mg/M^2.

The criterion for discontinuation of treatment, were as follows:

1. noncompliance of the patient to protocol requirements.
2. in cases of progressive disease or relapse after initial response.
3. signs of life-threatening organ toxicities attributed to the drug.

Before each treatment, pre-therapy hydration with 1 liter of normal saline over 2 hours was infused. Cisplatin was diluted in 1 liter of D_5W with 200 cc of 20% Mannitol as side drip and infused over 6 hours. VP-16 was diluated in 500 cc of D5W. Antiemetics were given simultaneously. Metoclopromide, 20 mg IV, was given 30 minutes prior to Cisplatin and repeated energy 4 hours when necessary. The following laboratory work-ups were determined every 3 weeks prior to the next course of treatment: BUN, Creatinine, SGOT, SGPT, Alkaline Phosphatase, LDH, Calcium, Uric Acid, Glucose, Serum Electrolytes, CBC and platelets. Tumor measurements and performance status were determined before each course of treatment.

Courses of treatment were repeated every 3 weeks interval unless patients have not recovered from the

toxicity of the previous course: Bleomycin was withheld in the presence of elevated serum BUN and Creatinine.

All important data (PE, involvement of all indicators of lesions, performance status, symptomatic status, laboratory tests, treatment schedule and dosages, toxicites to chemotherapy) were noted/compiled in the flow chart of the patients.

The criteria for evaluating response to study medications were:

1. Complete response (CR) – total disappearance of all measurable lesions with no new lesions and maintenance of status quo.
2. Partial Response (PR) –50% or greater decrease in diameter of all measured lesions without simultaneous increase in the size of the lesions or appearance of new lesions.
3. Stable Disease (SD) – no measured change or change within 25% of original tumor.
4. Progression (PD) of Disease – increase in 25% or more of measured lesions or appearance of new lesions.
5. Relapse (R) – appearance of new lesions or reappearance of old lesions in patients who achieve remission.

RESULTS:

A total of 35 patients who were entered into the study were randomized into groups A and B (Table 1). One patient from Group B was not included because he developed anaplylactoic reaction at the start of theraphy. Patients then were equally divided into 17 for either group. Although close follow-up was stressed, there were patients who failed to return after treatment evaluation, six (6) in Group A and three (3) in Group B (Table 2).

TABLE 1:

Total number of patients – 35

Treatment A – 17
Treatment B – 17
Patient with
Anaphylactoid
Reaction – 1

TABLE 2: PATIENTS LOST TO FOLLOW-UP (LTFU)

A	B	TOTAL
cisplatin + bleomycin	cisplatin + VP-16	
6 (35%)	3 (18%)	

Table 3 shows sex distribution for Group A and B consisting of 10 males/7 females for A, and 12 males/5 females for B (P 0.05).

TABLE 3: SEX DISTRIBUTION

	A	B
Male	10 (59%)	12 (71%)
Female	7 (41%)	5 (29%)
(P 0.05)		

The age distribution of our patients as shown in Table 4 has no statistically significant difference.

TABLE 4. AGE DISTRIBUTION

AGE (Years)	A	B
30	2	2
31-40	3	6
41-50	3	4
51-60	8	5
60	1	
(P 0.05)		

Our patients were then classified according to the severity of the disease based on clinical staging previously mentioned.

	A	B
Stage 1 (T_1 No)	5 (29%)	1(6%)
(Stage 2 (T_2 No)	1(6%)	3(18%)
Stage 3 (T_XN_1)	5(29%)	2(12%)
Stage 4 ($T_XN_{2-3}M_X$)	6(35%)	11(65%)

These patients had undergone radiotherapy with doses ranging from 4,000–9,000 rads for the primary tumor and 4,000–8,000 rads for nodal involvement prior to relapse. However, the patients were not stratified into relapse after first exposure or relapse after second exposure to external radiation. Table 5 shows the nutritional status of our patients in both groups. For Group A, 82% were 1st and 2nd degree malnourished. In Group B, 47% suffered from 1st and 2nd degree malnutrition.

TABLE 5 NUTRTIONAL STATUS

	A	B
Approximated Ideal Body Weight	3(19%)	9 (53%)
1° malnourished	10(59%)	7(41%)
2° malnourished	4(23%)	1(6%)

The toxic effects of the chemotherapeutic agents consisted of nusea, vomiting, anorexia in 100% of cases. 3 patients (27%) in A developed glossities. Dermatologic toxicities consisted of alopecia in 100% both A and B; increased pigmentation in 3 *27%) from A and 1 (7%) in B. Leukopenia was noted in 2 (18%) in Group A. However, this improved in 2-4 weeks afterdate of randomization. There wre no renal toxicities observed.

TABLE 6: TOXICITIES OF CHEMOTHERAPY

		A cisplatin + beomycin	B cisplatin + VP-16
I.	Gastrointenstinal		
	nausea	11	14
	vomiting	10	14
	anorexia	11	14
	glomitis	3	-
II.	Renal		
	azotemia	—	-
	hypomagnesemia	-	-
	creatinine clearance	-	-
III.	Dermatologic		
	pigmentation	3	1
	alopecia	10	14
	sensation of warmth on infusion	5	-
IV.	Hematologic		
	leukopenia	2	-
V.	Ototoxicity		

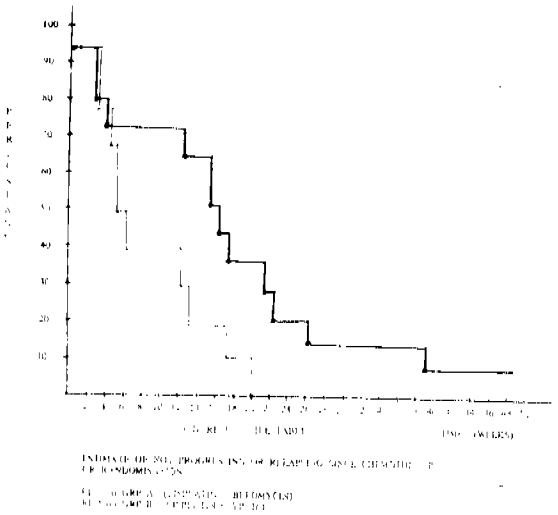
The response rates for Group A was 82%, 2 complete and 7 partial responses. For Group B, the response rate was 79% with 4 complete and 7 partial responses. In Group A, the median progression or recurrence-free interval was 9 weeks while Group B, 18 weeks. Although the % of response rates of A and B had minimal difference, the lonfger interval in B that a patient was disease free found to be statistically significant.

TABLE 7: INITIAL CLINICAL RESPONSE

	Treatment	CR	PR	SD	DP
GROUP A	cisplatin + bleomycin	2 (18%)	7 (64%)	1 (9%)	1 (9%)
GROUP B	cisplatin + VP-16	4 (29%)	7 (50%)	2 (14%)	1 (21%)

CR Complete response
PR Partial response
SD stable disease
DP disease progression

Life table (Fig. 1) shows the percentage of patients who have not relapsed or progressed after treatment. At 21 weeks, the probability of not relapsing 42% in Group B while in Group A is 25% at 13 weeks. Response to chemotherapeutic agents seemed more sustained on B compared to A. Life table of B looks better than A. The difference in response between A and B was found to be statistically significant using the Log Rank Test (X^2 = 4.13, P 0.0T).



DISCUSSION:

Recurrence in NPCa whether treated with radiotherapy and chemotherapy calls for palliation. Previous experiences with chemotherapy of NPCa and Head and Neck Cancer were limited. Methotrexate had been the most effective chemotherapeutic agent with response rates varying from 18-67%. However, its duration of response was about 2 months[10].

Previous studies of Cisplatin as a single agent in Head and Neck Cancer (Hill et al,; Lippmann et al) reported two (2) partial response and three (3) complete responses. The study in Stanford (1976-79) showed 50% of NPCa responders to Cisplatin as a single agent. They found that there was positive (+) correlation between response to treatment and degree of undifferentiation. They also reported that metastatic regions improved with Cisplatin. Since then, the interest in the use of Cisplatin increased particularly in combination with other agents.

Wittes et al (1975, 1977) and Randolph et al (1977) demonstrated superiority of Cisplatin + Bleomycin in combination by obtaining 75% objective response rate in previously untreated patients in comparison to 31% of patients with recurrence after surgery, radiotherapy and chemotherapy.

The superiority of Cisplatin and Bleomycin in advanced Head and Neck Cancer was reported by Shapshay et al (1980). However, combination of VP-16 and Cisplatin has not been tested in Head and Neck Cancer. The clinical experience with NPCa in general is unique because it is a relatively slow-growing malignancy, of the Head and Neck and its treatment is fraught with recurrece. In the Philippines, where NPCa incidence is high as mentioned, this trial is of therapeutic importance.

Our study of chemotherapy of recurrent NPCa has been challengingbecause of the following factors which could have influenced the outcome of this treatment namely:

1. radiation
2. nutrition
3. severity of the cancer
4. previous chemotherapy

Since our patients had recurrences after radiotherapy, possible decreased vascularity due to fibrosis in the tumor site may have hindered further efficacy of the drugs. 50% and 14% of our patients were 1st and second degree malnourished respectively. Although there was significant tumor regression in this group, swallowing defects caused by local tumor, and radiation induced fibrosis were compounded by the factor of gastrointestinal toxicities. Treatment response correlated with the severity of the disease. Our patients in Stage III and IV had more stable disease responses and progression as well as shorter duration of response, which could probably be attributed to tumor burden.

SUMMARY & CONCLUSION:

Twenty-five (25) patients with recurrent NPCa (Stage I-IV) were randomized to treatments A and B. Treatment A consisted of eleven (11) patients who were given Cisplatin 20 mg/M2/day for 5 days and weekly injection of Bleomycin 15 mg/M^2 IM until a dose of 250 mg is reached. Treatment B consisted of fourteen (14) patients who were administered Cisplatin 20mg/M^2 /day for 5 days and VP-16 60 mg/M^2/day for 5 days also. Overall response in A was 82% and 79% in B. However, duration of response in A was shorter with an average of nine (9) weeks while B had an average of eighteen (18) weeks. Toxicities were mainly gastrointestinal and alopecia. The superiority of the combinatin Cisplatin + VP-16 was established over Cisplatin + Bleomycin. The role of these chemotherapeutic agents appears adjunctive to the present primary mode of treatment: radiotherapy.

BIBLIOGRAPHY

1. Hirayama, T.: Descriptive and analytical epidemiology of nasopharyngeal cancer, nasopharyngeal carcinoma; etiology and control.
2. Baltazar, J.: Cancer registration in Metro Manila, Statistical *Report. 1975-1977. The Central Tumor Registry of the Philippines.*
3. UPCM PGH Hospital Tumor Registry Report, 1981, UPCM-PGH Clinical Oncology Group Personal Correspondence.
4. de Vita, V. et al: Principles and Practice of Oncology. Cancer; JB Lippincott (Philadelphia). p. 365, 1982.
5. Urdaneta, N., Fischer, J., Vera, R., Gutierrez, E.: Cancer of the nasopharynx: Review of 43 cases treated with super-voltage radiation therapy. Cancer 37: 1707, 1976.
6. Wang C., Meyer, J.: Radiotherapeutic management of Carcinoma of the nasopharynx. canc 28;5666, 1971.
7. Baker, S., Wolfe, R.: Prognostic factors of nasopharyngeal malignancy. Cancer 49: 163, 1982
8. Gregorio, Department of Radiology and Cancer Institute UPCM-PGH Personal Correspondence
9. Ho, T.: Stage Classification of nasopharyngeal carcinoma: A review nasopharyngeal carcinoma etiology and control. Lyon, France, LARC, p. 99 1979.
10. Jacobs, C.: Role of Cisplatin in Treatment of Recurrent Head and Neck Cancer: Cancered Vincent de Vita et al Lippincott, Chapter 30
11. Bradley et al: Cancer Chemotherapy III. The Forty-Sixth Hahmann Symposium, New York. p. 215, 1978.
12. Ho, J.: Nasopharynx Treatment of Cancer ed Keith Halman London, p. 249, 1982.
13. Shapshay, S. et al: Prognostic Indicators in Induction of Cisplatin, Bleomycin, Chemotherapy for Advanced Head and Neck Cancer. Vol. 140 October p. 543-547, 1982.
14. Shapshay, S et al. Histopathologic Findings After Cis-Platinum Bleomycin Therapy in Advanced Previously Untreated Head and Neck Cancer. American Journal of Surgery, Vol. 136 p. 534-538, Oct., 1978.
15. Peto, R. et al: Design and Analyis of Randomized Clinical Trials requiring Prolonged Observations of each Patient. British Journal of Cancer, Vol. 35 No. 1 p. 7, 1977.
16. Pocock, S.J.: Size of Cancer Clinical Trials and Stopping Rules; British Journal of Cancer, Vol 38 No. 757 p. 757-765, 1978.
17. Sako-Kumao et al. Chemotherapy for Advanced and Recurrent Squamous Cell CA of Head and Neck with High and Low Dos Cis-Diammonium American Journal of Surgery, vol. 136, p. 529 533, 1978, Oct.
18. Baker, S.: Preoperative Cisplatin and Bleomycin Therapy in Head and Neck Squamous CA: Arch Otolaryngology, Vol. 107, p. 683-689, Nov. 1981.

The Phil.
Jour of Oto.
Head & Neck
Surgery

EXTRACRANIAL APPROACH TO FRONTO-ETHMOIDAL ENCEPHALOMENINGOCELE*

Rodolfo Nonato, M.D.**
Jacob Matubis, M.D.***

INTRODUCTION

Fronto-ethmoidal meningoencephalocele is one of the congenital malformations that is now amenable to surgical therapy. Deformity is very noticeable and oftentimes results in emotional problems to the adult patient.[1]

Otolaryngologists have looked upon this condition as something beyond their skill. This paper will show a simple surgical approach to such condition. Any true otolaryngologist can easily do this simple technique. Complications can easily be managed.

To facilitate this study, three patients in the department of Otolaryngology of the medical center presenting with fronto-ethmoidal encephalomeningoceles underwent this extracranial operation. Table 1 shows the general data of the patients included in this study.

Table 1

Patient	Age	Sex	Date of Operation
1. Josefina Ancajas	30	F	7-24-82
2. Andrea Taan	15	F	5-13-80
3. Name unrecalled due to missing chart.	20	F	1978

SURGICAL TECHNIQUE

Various skin incisions can be utilized in the exposure of encephalomeningocele. The choice depends on whether it is unilateral or bilateral. An elliptical, curved, Y or H-shaped incision can be used around the base of the mass.[2] This can be excised, amputated if with peduncle, at the level of the skull defect, or merely pushed intracranially. This will depend on the surgeon's intraoperative judgment. If the encephalomeningocele is large enough and pedunculated, excision or amputation is warranted, but if it is small and compressible, mere freeing and pushing it intracranially is easily done and no excision is required.

Steps in the Operation

1. Skin incision is made depending on whether it is unilateral or bilateral. The choice should be based on adequate exposure and cosmetic healing.

2. Removal of interfering bones which include part of the frontal, nasal, ethmoid and lacrimal bones. In some cases, part of the maxillary bones may be involved depending on the size of the mass.

3. Direction of the encephalomeningocele from its surrounding tissue.

4. Excision or pushing intracranially of the encephalomeningocele. This is done at the level of the skull defect.

5. Closure of the dural defect with interrupted silk sutures at intervals of 1 to 2 millimeters.

6. Iliac bone harvesting.

7. Insertion and positioning of iliac bone and bone chips to support the reintroduced mass into the cranium and fill up the bony defect.

8. Closure of skin flaps in layers.

DISCUSSION

Fronto-ethmoidal encephalomeningocele is a congenital malformation commonly encountered by the practicing otolaryngologist. It is defined as the extracranial protrusion of the cerebral tissue and meninges through a congenital defect in the cranial osseous structures.[1] Also known as anterior or sincipital encephalomeningocele, it is usually located at the anterior part of the skull, at the root of the nose, between or just below the inner canthi, or at the middle part of the forehead or the side of the base of the nose.[3] Because of this peculiar presentation, it is the otolaryngologist who first encounters the problem, but, as was often done in the past, these cases are conveniently referred to the neurosurgeon.

Meningoceles in the anterior part of the head are rare in Europe and in America but appear to be common in Southeast Asia. In Thailand, these had been thoroughly studied by Suwanwela and Suwanwela who had proposed a morphological classification of these masses based on 100 cases seen within a period of 8 years.[6] In the Philippines, local studies seem inadequate.

Diagnosis of the classical cases is no problem. Clinical features vary from a swelling and widening of the root of the nose, to a mass or masses at the root or sides of the nose, with the eyes displaced laterally. The covering skin varies from thin and shiny or thick and wrinkled.[3]

* 2nd Prize

** Former Chief Resident, Dept. of Otolaryngology, UPCM-PGH Medical Center

*** Former Senior Resident, Dept. of Otolaryngology, UPCM-PGH Medical Center

skin aids in diagnosis include aspiration of the mass and determination of the sugar content of the fluid. Skull X-rays are helpful by showing an abnormally wide distance between the orbits. Polytomography and CT scan are of great benefit if available and financially affordable to the patient. The CT scan may demonstrate a connection between the mass and the cerebral space and the relationship of the encephalomeningocele to the base of the skull and facial bones.[1]

Possible *complications and sequelae* of untreated encephalomeningocele include associated brain damage like microcephaly, hydrocephalus, epilepsy, associated eye abnormality, brain exposure and hemorrhage, and rupture leading to CSF leak and meningitis.

Indications for treatment are 1) for cosmetic reasons, 2) to obviate further brain damage which may be caused by herniation of brain tissue into the sac, 3) to prevent subsequent meningitis in case of ulceration, rupture and leak of CSF, and 4) to facilitate care of the patient with the removal of the big mass.[3]

Contra-indications to treatment according to Koopman and also by Suwanwela are the presence of severe brain damage or little hope of normal mental development, and the presence of acute infection.[1, 3]

The *optimal time* suggested by the same authors is as early as the patient's condition would permit to minimize facial deformity and emotional disturbance, and to prevent further brain damage and herniation.

Surgical treatment is either intracranial or extracranial. *Intracranial approach* is suggested for the other types of encephalomeningocele which are the basal, occipital and the intracranial. This is a craniotomy operation and is quite formidable task best left to the neurosurgeons. The *extracranial approach* on the other hand is feasible for lesions with a shorts talk or canal and the intracranial end of the defect is accessible through the hole. It is therefore suitable for patients with a mass at the forehead or upper part of the root of the nose.[2] Youmans in his textbook adds that for lesions with a narrow base, pedunculated sac like the fronto-ethmoidal encephalomeningocele, the cranial defect is small and operative excision of such a massive lesion is quite simple.[4]

The *basic principles* to be observed in the excisions of encephalomeningoceles, according to Sakoda et al, are to fill in the bone defect and to insure a watertight closure of the dura.[5]

Thus, as an otolaryngologist, the patient comes for a nasal bridge mass for consultation and management. Upon thorough ENT examination and a diagnosis of encephalomeningocele, fronto-ethmoidal type is established, he refers the case to a neurosurgeon and assumes a hands-off policy.

This study shows a simple single approach which any true otolaryngologist can do, especially in a setting where emergency treatment is needed and no neurosurgeons are around.

The extracranial technique was found easy to perform, applicable to adult patients with nasal fronto-ethmoidal encephalomeningocele, and possibly also to young patients.

The 3 patients operated on are all well upon discharge. However, headache as a complaint was consistently present in all the patients. This was easily managed with oral analgesics. The headache spontaneously subsided after a few days.

Our first patient followed-up for two years post-op and presented no complication. The second patient had unilateral presentation of the encephalomeningocele. Excision was done. No complication was encountered and patient is still on regular follow-up. Our third patient presented with bilateral encephalomeningocele. No excision was done. The mass was reintroduced into the cranium and supported with an iliac bone. A week post-op she developed CSF leak from the incision site. Prophylactic antibiotic was given. After 2 weeks the CSF leak sealed off and the patient is well save for occasional headache. Her last follow-up was November 15, 1983 and she developed dacrocystitis. This was managed with antibiotics and lacrimal apparatus irrigation.

SUMMARY

We have seen three cases of fronto-ethmoidal encephalomeningoceles in the department of Otolaryngology. We used the extracranial approach of treatment in correcting the malformation by excision or amputation of the protruding mass and by reintroducing the mass into the cranium. Brain was supported and skull defect was filled in with bones and bone chips harvested from the iliac crest. Complications encountered were headache, CSF leak and dacrocystitis, but these were easily managed with analgesics, proper antibiotics and lacrimal apparatus irrigation.

The extracranial approach to fronto-ethmoidal encephalomeningocele is not beyond the skill of any true otorhinolaryngologist. It is easy, quite simple and can be successfully done with minimal resulting complications.

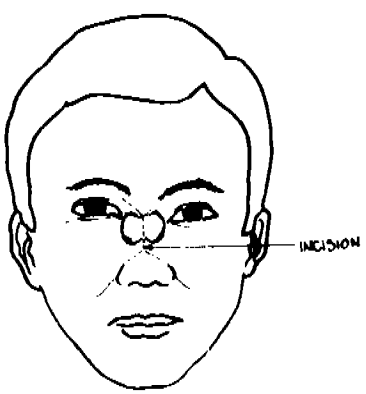


Fig. 1 – Horizontal H-incision.

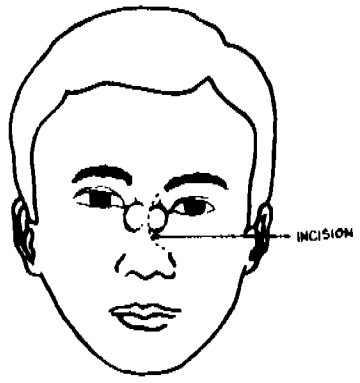


Fig. 2 – Curved incision.

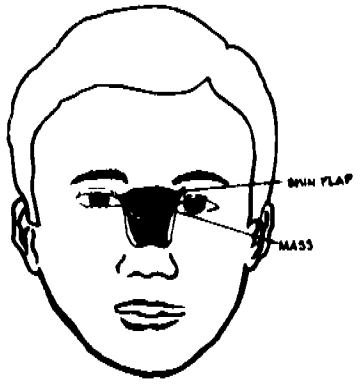


Fig. 3 – Raising of Skin Flaps.

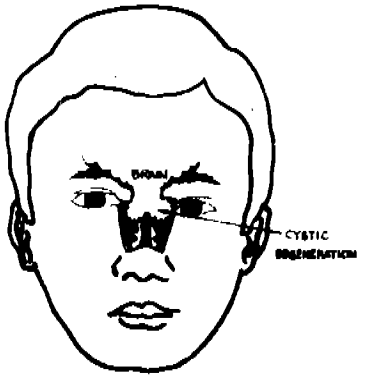


Fig. 4 – Dissection of mass.

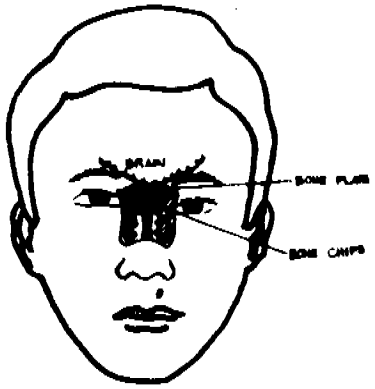


Fig. 5 – Grafting with bone plate and chips.

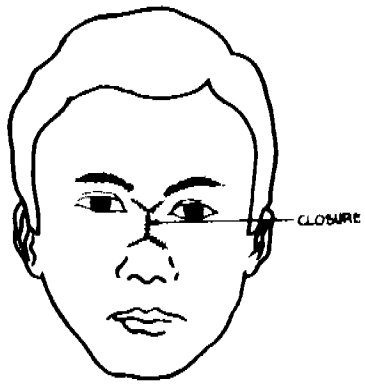


Fig. 6 – Closure of defect.

HERBAL REMEDY AGAINST THROAT INFECTION (PHARYNGITIS) A RATIONALE APPROACH*

Benito L. Uy, M.D.**

The clinician often regards the problem of pharyngitis as intellectually trivial and clinically unimportant. Neither attitude is justified. Pharyngitis challenges even the most astute diagnostician. Inspite of all the advances in therapy and tremendous efforts by clinicians everywhere to prevent, control and treat pharyngitis, little has been accomplished and still much needs to be done in the future. Many etiologic agents remain to be identified, differential diagnosis is difficult, determination of treatment strategy is complicated and pharyngitis can be associated with or lead to serious illnesses. Because of these, pharyngitis remains to be a costly medical problem. With the escalating cost of antibiotics and other related drugs, what chance is there for the common tao to have his pharyngitis treated.

Pharyngitis up to the present time continues to be an inflammatory process of unknown etiology. Even with the modern bacteriological and virological techniques performed under research conditions, no demonstrable infectious agent can be identified in the upper respiratory tract in almost half of these patients presenting with the clinical syndrome.

(Fig. 1)

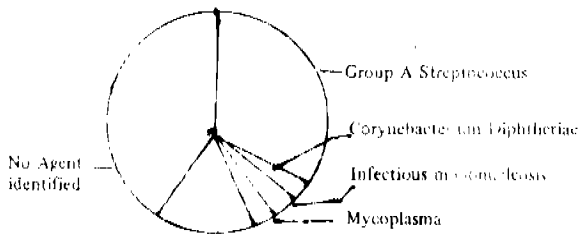


Figure 1. Causative organisms in Pharyngitis

Present mode of management of pharyngitis is divided into two. This includes systemic administration of oral and parenteral antibiotics and the local application and use of cautery, either chemical or electrical, various lozenges, mouthwash and oral sprays. In the absence of severe systemic manifestations, local medications maybe employed. A large number of these local preparations have no proven pharmacologic effects upon the etiologic agent, but merely produce symptomatic relief. Local antibiotic sprays are so prohibitive in their costs so that other medicinal agents of proven bactericidal effects must be discovered.

Therefore this study was conceived with the following objectives:

1. To look for scientific basis in the use of herbal preparation from the seeds of Ipomoea muricata, experimentally designated as CMG – 10 for primary health care of bacterial pharyngitis.
2. To compare the clinical response of patients with bacterial pharyngitis to CMG – 10 preparation with in vitro studies of clinical isolates from throat swabs against CMG – 10.
3. To evaluate the effectiveness of CMG – 10 in bacterial pharyngitis caused by gram positive bacteria in an open clinical trial.

ETHNOMEDICAL INFORMATION

In a book on medicinal cures written by Father Domingo Andres in 1928, and entitled "Say Medico Dilin Limayo," is an entry on "Pepita Maravillosa del Tunkin" (1). Fr. Andres described the plant as I having originated from the "Kingdom of Tunkin" possibly Hanoi. The plant is described as bearing flowers like "campanillas" and when dried has white seeds. The seeds, stems and leaves are said to be effective against several skin ailments like chronic and gangrenous wounds, cuts and blisters due to burns. The oil from the seeds is said to relieve stomach pain and earaches. But no mention has been recorded on its use to relieve sore throat.

MICROBIOLOGICAL STUDIES

The extract of the seeds of Ipomoea muricate (L.) JACQ. was found to inhibit gram positive Staphylococcus aureus ATCC 25923 and Bacillus subtilis ATCC 6633 at a minimum concentration of 500 ug/ml. The seed extract was found to be bactericidal to S. aureaus and the antibacterial activity was stable to heat and storage even after more than 3 years.

*3rd Prize–Co-winner
**Consultant, Dept. of E.N.T., U.S.T. Faculty of Medicine & Surgery.

PHARMACOLOGIC STUDIES

The seed extract of I. muricata showed relatively a low toxicity in mice, the LD_{50} being 7810 mg/kg body weight. Analgesic effect was observed in mice following Sandberg's and Taber et al methods. The effective dose ED_{50} of the extract as analgesic was determined by oral administration in mice. This was calculated as 100 mg/kg (16.9-589 mg/kg) by the Litchfield Wilcoxon method. From the ratio of the lethal dose (LD_{50}) and the effective dose (ED_{50}), the therapeutic index or margin of safety in mice of the seed extract of Ipomoea muricata was calculated to be 78.

Sensitization and primary irritation test were conducted on the abraded and intact skin of guinea pigs. Results showed that the seed extract did not cause any irritation, and hardly any allergic reaction on the skin of the guinea pigs. Preliminary trials also on guinea pigs using Baron et al "Cotton Pellet Granuloma Method" showed positive anti-inflammatory results.

PREPARATION OF CMG – 10

The drug preparation is made from seeds of Ipomoea muricata grown in the UST Botanic garden in 1982. The ground seeds were extracted with distilled alcohol and the resulting extract concentrated under vacuo to a syrupy consistency. This extract is dispersed in USP grade glycerol giving a palatable taste.

Clinical Isolates from Throat Swabs and CMG – 10

Clinical isolates from throat swabs showed sensitivity to CMG – 10 of gram positive isolates. (Table 1)

No. of Cases	Clinical Isolates (Pure) gram (+)	gram (–)	Sensitivity to CMG – 10	
11	Staphylococcus aureus		8 cases	+++
			2 cases	++
			1 case	+
5	B-H Streptococcus		3 cases	+++
			1 case	++
			1 case	–
4	alpha – H Streptococcus		4 cases	+++
1	Staphylococcus epidermidis		1 case	+++
3	Bacillus subtilis		3 cases	+++
3	Streptococcus viridans		3 cases	+++
1		Enterobacter aerogenes	1 case	–
1		Pseudomonas aeruginosa	1 case	–
2		Escherichia coli	2 cases	–
4		Klebsiella pneumoniae	4 cases	–

Table 1. +++ 16 mm and above (zone of inhibition)
++ 13 – 15 mm
+ 8 – 12 mm

Correlation between the in vitro microbiological assay of mixed cultures from throat swabs and clinical response to CMG – 10 of patients taken by random sampling is shown in Table II. Diagnosis was generally acute exacerbation of chronic pharyngitis.

Patient No.	Sensitivity to CMG – 10 (Mixed Cultures)*	Clinical Response**
014	+	++
019	–	+++
021	–	++
022	+++	+++
023	+	+
024	+++	dropout
025	++	++
027	+++	–
028	+++	dropout
038	+	++
039	+	++

Table II * +++ 19 mm and above (zone of inhibition)
++ 15-18 mm
+ 14 mm and below
– no inhibition

** +++ complete clearing within 5 days of treatment
++ moderate improvement
+ slight improvement
– no response

Materials and Methods

An open clinical trial was performed to determine the clinical efficacy of CMG- 10 on 75 patients with signs and symptoms of pharyngitis, ranging from fever, dysphagia, odynophagia, itchiness of throat, congestion, serous mucous exudate, lymphoid hyperplasia. Of the 75 patients, 55 were females and 20 were males. Their ages ranged from 11 to 61 years old with an average age of 28. Detailed clinical history was obtained and thorough examination was performed on each of the subjects. Throat swabs were taken for culture and sensitivity studies on 75 patients before the clinical trial. Excluded from this study were patients with peritonsillar abscess, chronic sinusitis and other conditions requiring the immediate use of systemic antibiotics.

The patients selected for this study were swabbed with CMG–10 three times a day for the first five days, then twice a day for the next five days and finally once a day for the last five days. Five days prior to treatment and during the duration of the treatment, absolutely no antibiotics should be taken.

Results

Causative Organisms in 75 Patients with Bacterial Pharyngitis

The result of the throat cultures was divided into gram positive seen in 72% and gram negative seen in 28%. Of the gram postive bacteria. The most predominant culture was Beta hemolytic streptococcus (20%), Alpha hemolytic streptococcus (24%), Staphy-

lococcus aureus (20%). For the gram negative, the most predominant culture was Klebsiella pneumonia (12%) and E. coli (8%). (Fig. 2)

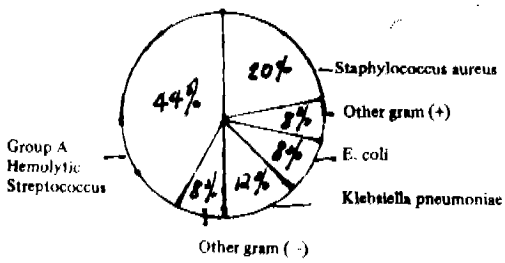


Fig. 2. Causative Organisms in 75 patients with bacterial pharyngitis

Clinical Diagnosis in 75 Patients with Bacterial Pharyngitis

The diagnosis was acute pharyngitis in 28%, chronic pharyngitis in 36%, chronic pharyngitis with acute exacerbation in 30% and 6% in tonsillopharyngitis. (Fig. 3)

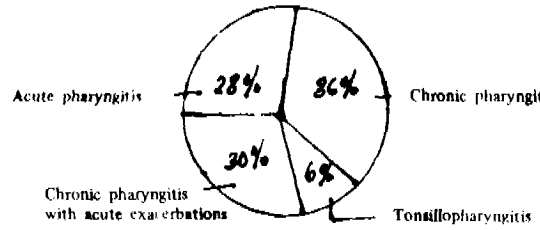


Fig. 3. Clinical diagnosis in 75 patients with bacterial pharyngitis

Response to Treatment of 75 Patients with Bacterial Pharyngitis

With regards to the clinical response to treatment of bacterial pharyngitis with CMG–10, 64% have good response (++ to +++) while 36% remained unimproved (0 to +). Criteria for clinical response were based on the disappearance of presenting manifestations graded from 0 to +++. Improvement was deemed present for those with ++ to +++ evaluation and no improvement for thsoe with 0 to +. (Table III)

PATIENT	AGE	SEX	MOST COMMON COMPLAINT	PREDOMINANT ORGANISM	RESPONSE	DURATION
1	11	M	I, D	alpha strep	++	8 days
2	12	M	O, F	Beta hemolytic strep	+	7 days
3	13	M	S, C, D	Staph. aureus	+++	5 days
4	13	M	F, D	Staph. aureus	++	5 days
5	13	M	I	K. pneumoniae	++	6 days
6	18	M	C, S, I	Staph aureus/ alpha strep	++	7 days
7	22	M	O, F, E	Staph aureus alpha strep	++	7 days
8	26	M	B, C, I	alpha strep	++	8 days
9	27	M	F, I, E	Staph. aureus/ alpha strep	+++	5 days
10	33	M	B, S, C, I	B-strep	+	10 days
11	33	M	S, C, D, E	K. pneumoniae	+	8 days
12	27	M	F, O	E. coli	+	9 days
13	87	M	C, I, D	Staph aureus	+++	7 days
14	28	M	C, I, S, E	K. pneumoniae	+	10 days
15	27	M	B, S, C	alpha strep	++	12 days
16	61	M	C, E, D	Staph. aureus/ B-strep	+++	5 days
17	32	M	B, I, F	Staph. aureus/ Strep B	+++	3 days
19	45	M	O, I, C	K. pneumoniae	+	9 days
20	26	M	B, S, D, E	K. pneumoniae/ Strepto A	++	10 days
21	25	F	I, O, C	Staph. aureus/ Strep. A	++	6 days
22	27	F	D, O, B	Staph. aureus	+++	5 days
23	26	F	F, I, O	P. aeruginosa	+	7 days
24	29	F	C, S, D	Staph. aureus	++	8 days
25	27	F	E, C, S	D. pneumoniae	+	9 days
26	28	F	I, F, S	Staph. aureus	+++	4 days
27	22	F	F, C, S	Staph. aureus	++	5 days
28	23	F	I, C, D	Strep. A	++	6 days
29	34	F	O, D, I	Strep. A	+++	3 days
30	34	F	I, B, S	Strep. B	++	6 days
31	33	F	F, I	Staph. aureus	+++	4 days
32	35	F	O, I, C	Strep. A	++	7 days
33	38	F	I, C	Strep. B	0	11 days
34	42	F	S, C, I	K. pneumoniae	+	9 days
35	48	F	I, S, C	Staph. aureus	+++	4 days
36	13	F	C, S	Strep. B	++	5 days
37	39	F	C, I, O	Strep. A	++	7 days
38	38	F	F, S, C, I	Strep. B	+	7 days
39	16	F	I, C, S	Strep. B	+++	4 days
40	20	F	F, S, C	Strep. B	+	10 days
41	14	F	F, S, C	Strep. A	++	5 days
42	18	F	I, C, S	Strep. B	+	8 days
43	16	F	F, S, C	K. pneumoniae	0	10 days
44	16	F	I, C, S	E. coli	+	9 days
45	12	F	C, S, F	Strep. A	+++	4 days
46	21	F	F, I, S	E. coli	+	11 days
47	24	F	C, F	Strep. A	+++	3 days
48	56	F	I, C	Strep. B	++	5 days
49	55	F	D, O	Strep. A	++	5 days
50	10	F	F, I, C, S	Strep. B	+	8 days
51	11	F	C, S, F	Strep. B	++	5 days
52	12	F	C, S, F	Strep. A	+	9 days
53	19	F	I, F, C	Strep. B	+++	4 days
54	28	F	F, I, D	P. aeruginosa	0	9 days
55	27	F	I, D, C	K. pneumoniae	+	8 days
56	50	F	I, C, D	E. coli	+++	7 days
57	23	F	C, S, I	Strep. B	++	5 days
58	23	F	I, C, D, B	E. coli	+	9 days
59	23	F	F, B, C	K. pneumoniae	++	9 days
60	13	F	F, C, S	N. catarrhalis	+++	6 days
61	12	F	C, S, F	Strep. B	+++	5 days
62	14	F	F, C, S	E. coli	+	9 days
63	40	F	I, D, B	K. pneumoniae	0	10 days
64	60	F	I, C, D	E. coli	+	7 days
65	41	F	C, I	N. catarrhalis	++	6 days
66	40	F	O, I, B	Strep. B	+++	4 days
67	27	F	C, I	B. subtilis	+++	6 days
68	26	F	I, B, O	E. coli	+++	7 days
69	28	F	B, C	K. pneumoniae	+	9 days
70	33	F	I, B, C	Strep. B	++	7 days
71	33	F	B, D, O	Strep. B	++	6 days
72	11	F	F, C, S	K. pneumoniae	0	9 days
73	32	F	I, B, O	Strep. B	+++	6 days
74	14	F	F, C, D	Staph. aureus	+++	4 days
75	21	F	F, I, C, S	B. proteus	+	9 days
					Average	6.94

Analysis of Data

Statistical analysis of the clinical response of patients with bacterial pharyngitis to CMG–10 was done using the 2 x 2 contingnecy table. Clinical response was compared with the gram staining property of the etiologic bacteria and its in vitro response to CMG–10. The coefficient of correlation between the two variables and the statistical significance was derived using the Z table.

Clinical Response

	Improved	No Improvement	Total
sensitive	36	6	42
not sensitive	12	21	33
Total	48	27	75

$$\phi = \frac{ad - bc}{\sqrt{klm}} = \frac{36(21) - 12(6)}{\sqrt{48 \times 27 \times 42 \times 33}}$$

$$= 0.51$$

Testing for significance:

$$Z = \sqrt{n} \qquad \phi = \sqrt{75}\ (0.51)$$

$$= 4.416$$

Table value $Z_{0.05} = 1.96$

Comparing the in vitro response of the microorganism to the eventual clinical response, there is good correlation between the two variables with $Z = 4.416$ ($Z_{0.05} = 1.96$). This indicates that the effectivity of CMG–10 in bacterial pharyngitis results from the direct action of CMG–10 upon the responsible microbiologic agent.

Summary and Conclusions

The Ipomoea muricata, locally known as Tonkin and experimentally designated as CMG–10, has been used in the clinical trial for the treatment of bacterial pharyngitis. It has been established beyond reasonable doubt that the alcohol extract of Tonkin is antibacterial against gram positive organisms and acid fast mycobacterium 607. That this biological property is stable even after 3 years of storage and is thermostable up to 120 degrees C. That the Tonkin extract has potent analgesic properties have been proven by experiments. It has also been shown to have a positive anti-inflammatory effects and more significantly, it is relatively non-toxic inspite of its potency. This is the first reported study of the use of CMG–10 as a local treatment for bacterial pharyngitis.

Seventy-five (75) patients with bacterial pharyngitis as proven by cultures were included in this clinical trial. Pre-treatment evaluation of these patients' symptomatology and clinical findings were obtained. Local treatment using regular throat swabs of CMG–10 as extracted from Ipomoe muricata was used.

Our study shows that there is indeed a significant correlation of the in-vitro antimocrobial activity of CMG–10 with actual clinical improvement of patients manifesting bacterial pharyngitis. Based on these patients' response to CMG–10 and the overall cure rate of 65% obtained in this particular study, we have shown that not only can duration of illness be shortened to an average of six (6) days, but also signs and symptoms can be alleviated to yield good to excellent results.

At this point, we propose further investigation of the efficacy of CMG–10 against gram positive bacteria and other conditions like tonsillitis. If eventually proven with certainty, then CMG–10 can be made readily available as a commercially inexpensive local therapeutic agent.

The Phil.
Jour of Oto
Head & Neck
Surgery

SUTURE FISTULOTOMY: A SIMPLIFIED APPROACH TO THE TREATMENT OF RANULA*

Leonardo C. Mangahas, Jr., M.D.**

Ranulas are now generally treated with excision of the cyst in continuity with total removal of the involved sublingual gland. At times an extended dissection into the submandibular region of the neck through an external approach is needed aside from the intraoral manipulation.

Such extensive surgery is warranted because, in the words of M. Stuart Strong, "these lesions look so easy to manage but they can be so embarrassing when they recur."

The surgical treatment of ranulas originated during the age of Hippocrates. Celsus excised these lesions. In 1716, Dionis described the ranula in his works on surgery.

The ranula is a benign, soft and painless cyst within the floor of the mouth. It is generally unilocular, unilateral and contains thick mucus. Columnar epithelium lines the inner cyst wall suggesting its ductile origin.

Two types of ranula are generally seen clinically. The first one is the simple or retention type which results from obstruction of the sublingual gland or any minor salivary gland. This usually lies above the mylohyoid muscle.

The sublingual gland is composed of several parenchymal groups which empty independently by way of the ducts of Rivinus into the oral cavity. Some of the more anterior of these ducts may unite to form a single larger duct of Bartholin which joins the submandibular duct of Wharton to empty at the sublingual papilla. Obstruction of the sublingual duct system can produce cystic degeneration of the gland by compression.

A partial duct blockage resulting from: 1. an inflammatory process. 2. desquamated epithelium. 3. stenosis and 4. calculi lead to the formation of a mucus plug. As secretion continues, a cyst forms behind the plugged duct.

The second type of ranula is the plunging or burrowing variety. It is believed to branchiogenic in origin: from the first branchial cleft. This large ranula may extend from the floor of the mouth into the lateral portion of the neck. The sublingual glands are not usually involved. This results from failure of obliteration of a cervical sinus during embryological development.

Marsupialization as well as segmental excision of the sublingual gland have been shown to be inadequate in the treatment of ranulas. Excision of the cyst in continuity with total removal of the involved sublingual gland has been found to result in lesser recurrences.

Surgery for these lesions, however, is not that easy altogether. The highpoints are the following:

1. resect entire cystic wall preferrably with the sublingual gland, especially in recurrent cases
2. avoid injury to lingual nerve and submandibular duct
3. identification of course of submandibular duct with a plastic catheter
4. meticulous ligation of blood vessels
5. excision of overlying mucous membrane which may be adherent to cystic wall and may contain up to 20 excretory ducts of the sublingual gland

Complications of the procedure include immediate post-operative hemorrhage, recurrence and injury to lingual nerve or submandibular duct.

With the above in mind, as well as the cost of any extensive operative intervention on the part of the patient, this study was designed to satisfy the following objectives:

1. To determine the applicability of this simple office procedure in the treatment of ranulas
2. To determine the efficacy of the procedure with regard to recurrences of the lesion.

Materials and Methods

Five patients seen from February, 1983 to October, 1983 at the Talon General Hospital, Ramos General Hospital and the Tarlac Provincial Hospital, all in Tarlac, Tarlac comprised the subjects of this study.

All five had simple types of ranula. No plunging

*3rd Prize – Co-winner
**Consultant in Otolaryngology, Tarlac Provincial Hospital

type was seen which is explained by the relative rarity of this lesion. Care was taken to diagnose and palpate for stones along the course of the submandibular duct. Two such patients who had sialolithiasis as the cause of their cysts were excluded from the study for the simple reason that removal of the stone alone relieved the obstruction.

It was routine procedure to inform the patients about the accepted modes of treatment for ranula. However, when told of the risks of local and general anesthesia, cost involved in the operative procedure and possible complications, all five patients readily consented to this less invasive approach.

Patient profile is as follows:

Name	Age	Sex	Lesion Position	Duration
Dolor, Leonora	13	F	Right	3 months
dela Cruz, Edna	12	F	Left	2 months
Bautista, Susana	15	F	Left	1 year
Altares Wilma	23	F	Left	3 months
dela Cruz, Corazon	27	F	Left	3 years

Three of the patients were previously untreated while two were recurrent cases. Susana Bautista and Corazon dela Cruz were the latter patients and both had the longer lesion duration. Previous treatment received by both were needle aspirations.

The procedure itself is done in the office with the patient in the sitting position. A Xylocaine 10% spray anesthetic is not an absolute necessity, although it may be helpful in the extremely anxious patient.

Cotton, silk or Dexon polyglycolic acid suture materials of the larger sizes may be used. For added bulk, the suture material is folded over itself such that four strands compose the stitch. This is done to ensure that the fistula formed will be sufficient enough to permit the drainage of thick mucus. A large-sized needle is necessarily used so that the four strands can fit into its large French eye or hole. Each stitch is then tied using or employing the standard surgeon's knot or the triple surgeon's knot.

Post-operative orders include a full diet and the use of an oral local antiseptic. Follow-up is done every other day for the first week and weekly thereafter for the next three weeks. Appropriate therapy is given as the need arises during the follow-up period. Stitches are removed after one month.

Results

It is rather interesting to note that the procedure was tolerated well by all five patients. Nobody begged off from the manipulation which lasted from as short as 5 minutes to as long as 15 minutes.

The following table illustrates the type of suture material and the number of stitches employed:

Name	Lesion Size	Suture Material	Number of Stitches
Dolor	2 x 2 cm	silk 3 0	two
dela Cruz, E.	2 x 2 cm	cotton 3–0	two
Bautista	3 x 2 cm	dexon 0	one
Altares	2 x 1 cm	silk 1 -0	one
dela Cruz, C.	3 x 3 cm	cotton 3 0	four

When it comes to recurrences, the following table shows the results:

Name	Length of Suture Stay	Recurrences
Dolor	one month	none
dela Cruz, E.	one month	one month after removal
Bautista	one month	none
Altares	one month	none
dela Cruz, C.	one month	two weeks after removal

Patient discomfort in the form of interference with mastication was noted in two patients. This feeling however was not serious enough to cause any undue weight loss or refusal to intake of food.

No infection was noted post-operatively in any of the patients. Complications such as intraoperative or post-operative hemorrhage, injury to lingual nerve or to submandibular duct were not noted.

Discussion

This study shows that the creation of a fistulous tract is a satisfactory method of solving the problem of cysts in the floor of the mouth.

While it is true that recurrences occur with this very simple technique – with a far higher rate probably than either marsupialization or segmental excision of the sublingual gland – the procedure employed for such recurrent lesions is not the very extensive oral and cervical dissection but still the same inexpensive suture fistulotomy. The two patients in this study who had recurrent lesions after the first fistulotomy procedure were subjected to the same technique and this second procedure has resulted in non-recurrence up to the present time.

It sometimes perplexes the mind to think that for the problem of ranula, a ductile and not a parenchymal disease of the sublingual gland, the accepted

procedure of surgical treatment will be the total removal of the sublingual gland. In essence, the surgeon may be removing a very normal sublingual gland. The argument proposed by many as to why this structure has to go is that the possibility of recurrences will be lower with its removal. And as M. Stuart Strong said, "the embarassment will be gone."

This suture fistulotomy technique, however, offers a new perspective in that: one does not tamper with a normal sublingual gland and one can easily brush aside the embarrassment of seeing the recurrence by giving an inexpensive and an easily performed treatment.

BIBLIOGRAPHY

1. Batsakis, J. G.: Tumors of the Head and Neck. Baltimore, The Williams & Wilkins Co., 1974
2. Batsakis, J. G.: Neoplasms of the Minor and Lesser Major Salivary Glands. Surg., Gynec., Obstet., 135: 289-298. 1972.
3. Rankas, R. M.: Surgical Decisions in the Treatment of Major Salivary Gland Tumors. Plast Reconstr. Surg. 51: 514-523, 1973.
4. Krolls, S. O.: Trodahl J. N.: Salivary Gland Lesions in Children. Cancer. 30: 459-469, 1972.
5. Castro, E. B.: Tumors of the Major Salivary in Children. Cancer, 29: 312-317, 1972.

The Phil.
Jour of Oto.
Head & Neck
Surgery

NOISE-INDUCED HEARING LOSS AMONG DISCO HOUSE WORKERS

Francisco Victoria, M.D.*

I. Introduction:

Studies have established a direct correlation between noise and hearing damage.8,9,10,11,13,15 Noise-indued hearing loss is well investigated and documented in industries, followers and players of rock and roll music and orchestral musician, but few works has been done, if any, among the disco crowd especially those who are regularly exposed to its very loud music – the disco house workers.

II. Objective:

It is the purpose of this study to try to establish the prevalence of noise-induced hearing loss among such wokers, if any.

III. Review of Literature:

Pathological changes in the end organ of Corti among experimental animals and human temporal bone subjected to different intensities of sound have been demonstrated.16,17 Subsequently, theories have been formulated and raised regarding the biochemical and mechanical factors contributing to hearing impairment.3

A study by G.A. Westmore and I.D. Eversden of noise induced hearing damage among orchestral musicians showed 23 (53.82%) of 68 ears had NIHL, but most of these showed only slight or early change. Only 4 of the 23 ears affected had a hearing loss of more than 20dB at 4Khz, Gryenznska and Czyzewski performed audiometry on 51 orchestral musicians and found only 16 (13.4%) of them to have bilaterally normal hearing, 11 (21.56%) of the remainder had a clear evidence of NIHL.

Flach found only 44 (15.5%) of 277 professional musicians to have sensorineural hearing loss, and of these only 10 (3.9%) were attributed to NIHL. (See table 1)

Table I
Results of Different Studies of NIHL

	No. of Subjects/Ears Tested	NIHL
Westmore and Eversden	68	23 (33.82%)
Gryeznska and Cyzyzewski	51	11 (21.56%)
Flach	277	10 (3.9%)

IV. Materials and Method:

Volunteer workers from Stargazer Disco at the Silahis International Hotel were chosen as subjects. The 225 sitting capacity disco hall is located at the 19th floor of the hotel's building and measures approximately 165.05 sq.m. in total floor area. The room is provided with acoustic reflective materials and is enclosed by glass and cement walls. Sound Pressure level was measured using the Rion sound level meter of the National Pollution Control Commission. The methods used in measuring the sound level are as follows, in "A" scale.

a) the figure indicated by the sound level meter where its indicator shows no fluctuations or only small fluctuations.

b) where the indicator of the SLM records periodic or intermittent fluctuations with the highest peak almost regular, the average of the highest peaks for respective fluctuations is recorded.

c) where the indicator of the SLM records irregular an big fluctuations, the figure on the higher end of the 90% range of the level is recorded.

The equivalent of the volume control level of the Numark Sound Systems play deck to the sound level meter were taken and measured as follows, with the master volume control set at 10 and 16 equivalent to about 75 dBA.

Table 2
Equivalent Level of the Volume Control against the Sound Level Meter

Volume Level	SLM dBA
1	84
2	94
3	98
4	102

(See Appendix "A")

At level 4 where it is stationary for most part of 8 hours and measured at 102 dBA, it is equal to a previously measured rock tape player of 97-104 dBA. **The volume control is seldom set at more than 4 because the intensity of the sound casues breakages of glass wines.**

Sound pressure levels have been recorded and computed using the SLM in the 3 different sampling stations of the disco hall in order to get the average range of sounds intensity emitted by speakers in these three areas frequented by the workers which are as follows,

*Chief Resident, Dept. of Otolaryngology, Ospital ng Maynila.

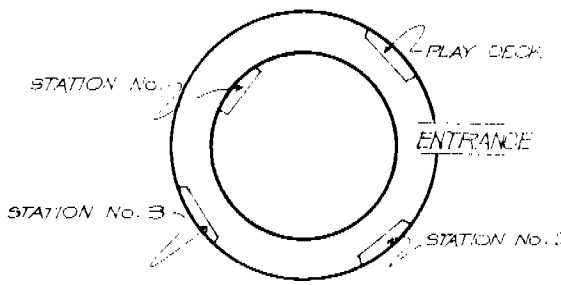
Station No. 1 – (very near the dance floor) –102 dBA, about 3.5 meters from the center and 1.5 meters from the nearest speakers,

Station No. 2 – (Bar I) – 97 dBA, about 6 meters from the center and 4 meters from the nearest speakers. and

Station No. 3 – (Bar II) – 89 dBA, about 12.5 meters from the center and 7 meters from the nearest speakers.

Compared, the allowable sound intensity set by the National Pollution Control Commission and the US Department of Labor, the results are much up high. (see Appendixes B and C)

SCHEMATIC DIAGRAM OF THE DISCO HALL



Pure tone audiometry was performed and audiograms were constructed from readings taken at 0.25, 0.5, 1, 2, 4, and 8khz from 34 individuals, 17 subjects and 17 controls. This was done in a quiet room after 12-16 hours from noise exposure in order to minimize if not eliminate the effect of transient threshold shift. *SPL was measured in the audiometer room and recorded at 39-45 dBA. This is within the maximum allowable SPL for audiometer rooms.*

TABLE 6

Maximum Allowable SPL for Audiometer Roms

Octave Band Center frequency (HZ)	500	1000	2000	4000	8000
SPL (dB)	40	40	47	52	62

Of the 17 subjects included in this study, 8 were males and 9 females, with ages ranging from 20 to 38 years and length of service from 8 months to 6 years but with the same exposure time of 8 hours a day, 6 days a week. *(See Appendix D)* Questioners from the subjects were given to be filed up. *(See Appendix E)* After which physical exminations were done including otoscopy, tuning fork tests, and pure tone audiometry.

The same number of medical interns and resident physicians from the Hospital Ng Maynila were taken to serve as control. There were 9 males and 8 females and with ages ranging from 23 to 30 years. *(see Appendix F)* All were subjected to similar screening tests as those of the volunteer workers in order to establish the incidence of hearing loss between these two groups, at the same time serve as an indicator of reliability for the method used for determining the hearing loss among disco house workers. *(see Appendix G)*

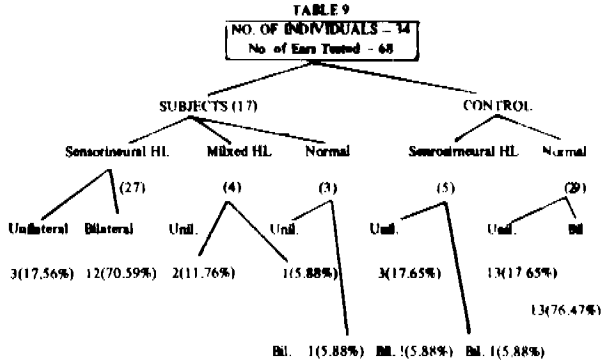
TABLE 7
Degree of Hearing Loss Among the Disco House Workers

	Sensorineural HL% *		Mixed Type of HL% *		Normal Tracings	
	AD	AS	AD	AS	AD	AS
Mild	12	13	3	1	1	2
	70.58%	76.47%	17.64%	5.88%	5.88%	11.88%
Moderate	1	1	–	–	–	–
	5.88%	5.88%	–	–	–	–
Severe	(M-S)	(M-S)	–	–	–	–
Total	76.47%	82.35%	17.54%	5.88%	5.88%	11.88%

TABLE 8
Degree of Hearing Loss Among the Medical Workers

	Sensorineural HL% *		Normal Tracings	
	AD	AS	AD	AS
Mild	3	2	14	15
	17.65%	11.76%	82.35%	88.24%
Total	17.65%	11.76%	82.35%	88.24%

TABLE 9



VI. Discussion:

A total of 34 individuals – 17 disco house workers and 17 controls – were included in this study. Of this number, 15 (88.23%) were found with bilateral (SNHL) – 14 disco house workers and only 1 from the control group. While the hearing loss for the most part was mild, the discrepancy is indeed very significant. The bilaterality of hearing impairment lends support to this contention.

The one case with moderate to severe SNHL had a previous exposure when she was employed in a textile factory. This subject actually complains of diminished hearing in both ears but somehow still gets along well with her work.

Four (11.76%) of the tested ears showed mild to moderate mixed type of HL. Two of these subjects had chronic otitis media in their early age. Otoscopic examinations revealed healed perforation with thinning of the tympanic membrane but still with visible ossicles.

Three (8.82%) of the subjects exhibited normal hearing in one ear while only one (a disc jockey) showed normal hearing in both ears which perhaps can be attributed to his wearing of a headset which somehow attenuates the very loud intensity of the disco sounds.

Again, his being just about 1 year and 9 months on the job with a regular alternate after 4 hours will also help explain this phenomenon. The other subjbect who exhibited a unilateral normal hearing on the left ear is a cocktail attendant who has been on the job only for about 8 months but her right ear is beginning to show an early sign of sensorineural HL dB at 250-500hz.

Many of these workers had expressed their fears and anxieties about the noise levels to which they are exposed to but they just seem to ignore this since it is the hazard of their job.

On the other hand, a total of 13 (76.47%) control medical workers has bilateral normal hearing on pure tone audiometry. Only one (5.88%) control exhibited a mild bilateral sensorineural HL. His right ear was traumatised when he was about 2 years old but presently with normal otoscopic findings, otherwise no contributory history or physical finding can explain the mild sensorineural HL for this control worker. Three control workers exhibited unilateral mild sensorineural HL but with normal tracings on their other ears.

VII. Conclusions:

While the methods employed in this study are not without sources of errors notably absence of pre-employment audiometry, absence of sound proof room, calibration errors, headphone position variations, headset pressure against the external ears, simulation or malingering, residual temporary threshold shift at the time of examination and improvement of performance of the subject following familiarization with the testing procedures, still it is clear that there is a direct correlation between the duration and frequency of exposures of individuals to high intensity sounds and hearing loss.

APPENDIX A

Table 3 Range of Intensity of Portable Units with Stereo Earphones

Volume Setting	FM Stereo No. 276952	FM Stereo No. 273917	Tape Player (Rock)	Tape Player (Broadway)
1	72-78	84-92	66-73	70-85
2	81-85	90-97	42-87	82-96
3	85-91	93-99	89-96	85-98
4	93-98	101-108	97-104	94-76
5	99-103	107-113	102-106	95-111
6	106-108	108-114	103-110	95-104
7	110-118	110-118	110-117	111-118
8	115-122	115-123	115-122	110-124
9	115-122	119-124	117-124	116-128
10	118-123	117-125	119-125	110-128

APPENDIX B

Table 4 Environmental Quality Standards for Noise in General Areas

Category of Area	Daytime	Morning & Evening	Nighttime
AA	50 dB	45 dB	40 dB
A	55 dB	50 dB	45 dB
B	65 dB	60 dB	55 dB
C	70 dB	65 dB	60 dB
D	75 dB	70 dB	65 dB

APPENDIX C

Table 5 US Department of Labor Occupational Noise Standards (1969)

DURATION/day (hrs)	Sound Level (dB), slow response
8	90
6	92
4	95
3	97
2	100
[illegible]	102
[illegible]	105
[illegible]	110
[illegible]	115

APPENDIX D

Table 6 Subject Disco House Workers

Name Initial	Age	Sex	Nature of work	Frequency of exposure 8 hrs/day 6 days/wk	Audiometric Results/Remarks
1. V A	26	F	R	6 years	10-25dB at 250hz-1khz 45dB at 8khz, a.d. 25dB at 250-500hz 30dB at 4khz, a.s. Resides near a RR track SN HL mild, a.u.
2. F D.	23	F	C	4 years 6 months	30-40dB at 250-500hz (SN) 45-50dB at 1-2khz (Cond.) 50dB at 8khz, a.d. 25-30dB at 250-500hz, a.s. Mixed type HL, a.d. SN HL mild, a.s.
3. P S	24	F	CA	3 years 6 months	40-45dB at 250hz-4khz, a.d. 25-30dB at 250hz-4khz, a.s. SN HL mild, a.u.
4. R [illegible]	21	F	CA	3 years	30dB at 250-2khz, a.d. 15-25dB at 250hz-4khz, a.s. Resides near a RR track SN HL mild, a.u.
5. L B	23	F	CA	[illegible] years	30-35dB at 250hz-1khz [illegible]dB at 4khz, a.d. 30dB at 250hz-4khz, a.s. SN HL mild, a.u.
6. R I	22	F	CA	[illegible] years	[illegible]-25dB at 250hz-2khz, a.d. [illegible]-25dB at 250hz-2khz, a.s. SN HL mild, a.u.
7. J B	22	F	CA	2 years [illegible] month	[illegible]dB at 250hz-4khz, a.s. [illegible]-25dB at 250hz-1khz, [illegible]dB at 4-8khz, a.[illegible] SN HL mild, a.u.
8. S R	24	F	CA	1 year 4 months	[illegible]-70dB at 250hz-8khz, a.d. [illegible]dB at 250hz-8khz, a.s. worked at Artificial Weaving Company SN HL moderate to severe, a.u.
9. C B	21	F	CA	8 months	35dB at 250-500hz, a.d. SN HL mild, a.d. Normal Tracing, a.s.
10. [illegible]	[illegible]	M	HW	[illegible] years	40-25dB at 250hz-2khz (SN) 65-45dB at 4-8khz (Cond.) a.d. (+) COM, healed perforation Mixed type HL, a.d. 10-35dB at 250-500hz, a.s. SN HL mild, a.s.
11. R [illegible]	18	M	CW	[illegible] year	[illegible]-40dB at 250hz-8khz, a.d. (+) COM, healed perforation [illegible]-30dB at 250hz-8khz, a.s. Mixed type HL, a.u.
12. [illegible] M	[illegible]	M	W	5 years	[illegible]dB at 250hz-4khz, a.d. [illegible]-25dB at 250hz-4khz, a.s. SN HL mild, a.u.
13. A L	23	M	W	5 years	20dB at 250hz-4khz, a.d. 30-40dB at 250hz-4khz, a.s. worked at Shakey's for 2½ years SN HL mild, a.u.
14. W F.	32	M	S	3 years	10-25dB at 250-500hz, a.u. SN HL mild, a.u.
15. F C	26	M	W	2 years 6 months	20dB at 250hz-4khz, a.d. [illegible]dB at 250hz-4khz, a.s. SN HL mild, a.u.
16. J H	20	M	DJ	1 year 9 months	Normal tracings, a.u. Uses headset and with regular alternate at 4 hours interval
17. R C	21	M	W	1 year 6 months	[illegible]-25dB at 250hz-2khz, a.d. 10-25dB at 250hz-2khz, a.s. worked as a [illegible] for [illegible] years

APPENDIX E

FORM No. 1 Questioner for Disco House Workers

1. Name ________________ Age ______ Sex ______
2. Address ________________________________
3. Type of Environment ______________________
4. Nature of Work ___________________________
5. No. of years in the present job _______________
6. Frequency of Exposures ____________________
7. Use/Non-use of protective ear plugs ____________
8. Other sources of noise exposures and frequency and duration:
9. Family History
10. Past Medical History
    a) before birth (maternal)
    b) drugs used
    c) sickness or diseases
    d) trauma (specifically temporal bone area and ear)

11. Present Medical History and Pertinent Physical Examination findings
    a) Otoscopy
    b) Tuning Fork Tests
    c) Pure Tone Audiometry
    d) Present General Health Status

APPENDIX F

Table 7 Control – Medical Workers

Name Initial	Age	Sex	Nature of work	Audiometric Results/Remarks
1. E.S.	23	F	PGI	Normal Tracings, a.u.
2. S.P.	27	F	PGI	Normal Tracings, a.u.
3 I.P.	25	F	PGI	Normal Tracings, a.u.
4 M.S.	25	F	PGI	25dB at 250hz-2khz, a.d. NT, a.s. SN HL mild, a.d.
5. A.R.	25	F	PGI	Normal Tracings, a.u.
6. G.T.	24	F	PGI	Normal Tracings, a.u.
7. A.V.	29	F	RP	30-25dB at 250hz-2khz, a.d. NT, a.s. SN HL mild, a.d.
8. F.C.	30	F	PGI	NT a.u.
9. P.L.	29	M	RP	NT, a.d. 25dB at 1-2khz, a.s. SN HL mild, a.s.
10. V.G.	25	M	PGI	30dB at 250hz-4khz, a.d 25dB at 500hz-2khz, a.s (+) trauma a.s., 2 y. o SN HL mild, a.u.
11 C.R.	29	M	PGI	Normal Tracings, a.u.
12. F.R.	24	M	PGI	Normal Tracings, a.u.
13. R.R.	24	M	PGI	Normal Tracings, a.u.
14 S.R.	25	M	PGI	Normal Tracings, a.u.
15. A.R.	25	M	PGI	Normal Tracings a.u.
16. F.L.	26	M	PGI	Normal Tracings, a.u.
17 J.G.	27	M	PGI	Normal Tracings, a.u.

APPENDIX G

FORM No. 2 Control – Medical Workers Questionaire

1. Name _____ Age____ Sex
2. Address _____
3. Type of Environment _____
4. Nature of Work _____
5. Sources of Noise exposure and duration and frequency
6. Family History
7. Past Medical History
    a) before birth (maternal)
    b) drugs used
    c) sickness or diseases
    d) trauma (specifically temporal bone area and ear)
8. Present Medical History and Pertinent Physical findings
    a) Otoscopy
    b) Tuning Fork Tests
    c) Pure Tone Audiometry
    d) Present General Health Status

BIBLIOGRAPHY

1. A.M. Martin, "Hearing Conservation and Noise Reduction", *Scientific Foundation of Otolaryngology*, 1976, pp. 151-169.
2. J.R. Hassall, M. Sc. and K. Zaveri, M. Phil., *Acoustic Noise Measurements*, 1979, pp. 43, 45, 49, 53, 62, 76, 131, 266, 271.
3. W.Dixon Ward, Ph.D., "Noise-induced Hearing Damage", *Otolaryngology Vol. II*, 1980, pp. 1788-1801.
4. James Jaeger Ph.D. and Susan Jerger, M.S., "Measurements of Hearing in Adults", *Otolaryngology Vol. II, 1980, pp. 1225-1249.*

   urements of Hearing in Adults", Otolaryngology Vol. II, 1980, pp. 1225-1249.
5. Lloyd L. Price, Ph.D. "Pure Tone Audiometry, *Audiological Assessment*, 1971, pp. 168-200.
6. Irving Hochberg, *Interpretation of Audiometric Results*, 1977.
7. Maico Audiological Library Series Vol. I and II.
8. G.A. Westmore, M.B., FRCS and Ian D. Everden, B. Sc., M. Phil., "Noise-induced Hearing Loss and Orchestral Musicians", *Archives of Otolaryngology*, Vol. 107, Dec. 1981, pp. 761-764.
9. Dareell E. Rose, Ph. D., "Noise and Hearing Loss", Postgraduate Medicine, Vol. 70, No. 2, August 1981, pp. 119-129.
10. A.E. Katz, M.D., H.L. Gerstman, D. Ed., R.G. Sanderson, M.A., R. Buchanan, M.A., Stereo Earphones and Hearing Loss", The New England Journal of Medicine, Vo. 307, No. 23, Dec. 2, 1982, pp. 1460-1461.
11. Raymond Hetu, Ph.D., "Critcal Analysis of the Effectiveness of Secondary Prevention of Occupational Hearing Loss", *Journal of Occupation Medicine*, Vol. 21, No. 4, April 1979, pp. 251-254.
12. Official Gazette, October 6, 1980, pp. 7545-7547, Vol. 76, No. 40.
13. D.W. Robinson and W. Burns, "Audiometry in Industry," *British Medical Journal*, September 2, 1978, p. 706.
14. Daphne Gloag, "Noise: Hearing Loss and Psychological Effects," British Medical Journal, Vol. 281, Nov. 15, 1980, pp. 1325-1327.
15. D. Y. Chung, Ph.D. and R.P. Gannon, M.D., "Hearing Loss Due to Noise Trauma," *Clinical Records*, Vol. 94, April 1980, pp. 419-423.
16. T. Egami, M.D., I. Sando, M.D., John H. Sobel, M.D., "NIHL, A Human Temporal Bone Case," *Annals of Otolaryngology*, Vol. 87, pp. 808-874, 1978.
17. W. Dixon Ward, Ph.D., A.J. Ducal III, M.D., P.A. Santi, Ph.D., C. W. Turner, MS, "Total Energy and Critical Intensity Concepts in Noise Damage," *Annals of Otolaryngology*, Vol. 90, 1981, pp. 584-589.

The Phil.
Jour of Oto.
Head & Neck
Surgery

CLINICAL PROFILE OF NASOPHARYNGEAL CARCINOMA IN FILIPINOS

Mario M. Yatco, M.D.*
Benito L. Uy, M.D.*

Nasopharyngeal carcinoma (NPC), an aggressive malignant disease is currently a topic of great interest because of the diagnostic and therapeutic challenges it poses to the otolaryngologists. In patients with nasopharyngeal carcinoma, the prognosis is adversely affected when the neoplasm causes cranial nerve impairment and destruction of the skull base.

Treatment of nasopharyngeal carcinoma in its early stage is most successful. But quite often, it is only after the disease have metastasized to adjacent structures that nasopharyngeal carcinoma is diagnosed. The variable clinical manifestations and the inaccessbility of the anatomic region usually impedes an early diagnosis.

This paper was formulated in an effort to establish a local study and to compare these features with that of foreign literature.

MATERIALS AND METHOD

The medical records of 108 patients admitted from 1971 to 1983 were reviewed. Age, sex, family history, smoking habits, presenting symptoms, race, physical findings, stage of neoplasm at presentation and histologic diagnosis were included.

All biopsies were performed either local or general anesthesia. There were no reported operative or post-operative complications.

The stage of the tumor was determined on the basis of the clinical data according to the American Joint Committee for Cancer Staging and End-Results Reporting.[1]

RESULTS

*From the Dept. of E.N.T., U.S.T. Faculty of Medicine & Surgery

Patient Profile:

Of the 108 patients included in this study, 82 were males and 26 were females. Their ages ranged from 17 to 73 with a mean average of 45. There was a broad age distribution with many young patients. Approximately one third (1/3) of the patients were 35 years old or younger

Family history revealed positive for malignancies in 24 patients and negative for 84 patients. With regards to smoking habits, 32 were smokers while the rest were non-smokers. However, the frequency and duration of smoking were not reported. 23 or about 21% of the total patients were of Chinese descent.

Site of Primary Symptoms:

The site and frequency of the first symptom are shown in Table I. 47% first noted a mass on the neck. 15 or 14% have problems referrable to the throat. 11% have one or more symptoms in the eye and ear respectively. The nose accounts for 8%, while the face constitute another 8%.

42% of the patients exhibited initial symptoms in 2 or more sites, whereas 58% have symptoms confined to one site only.

Symptoms of Nasopharyngeal Carcinoma:

The frequency of symptoms of nasopharyngeal malignancies are shown in Table II.

64% of the patients reviewed had nasopharyngeal symptoms consisting of obstruction and epistaxis. Otologic complaints ranging from serous discharge, tinnitus and decrease in hearing acuity accounts for about 60%, 34% have ophthalmoneurologic manifestations such as blurring of vision, diplopia and ptosis. About 77% have neck masses. Nuchal pain, pain on yawning and mastication were appreciated in another 30%. The rest of the features consist of numbness and paralysis of the face and pharyngeal symptoms.

Pathologic Findings:

Table III shows the distribution and frequency of the patients by histopathologic diagnosis. The most common was poorly differentiated epidermoid carcinoma accounting for 44%. 27 patients or 25% had moderately differentiated squamous cell carcinoma. 14% had undifferentiated carcinoma. Lymphoepithelial carcinoma manifested in 8% of the patients. 6% of the patients had transitional cell carcinoma while 3% had anaplastic type.

Classification of Malignancy:

All tumors were staged according to the TNM system of classification adopted by the American Joint Committee for Cancer Staging and End-Results Reporting. Table IV lists the most recent classification.

The distribution and frequency of patients according to tumor site and nodal involvement is shown in Table V.

On tumor primary site, 27 patients or 25% had T1s classification or carcinoma in situ. T1 or tumor limited to one site was present in 8%. 33 of 108 patients had T2 type or tumor involving both the superior wall or vault and the lateral wall. T3 or tumor extending to the nasal cavity, oropharynx or pterygoid space appeared in 11% while 27 patients or 25% showed T4 or tumor extending to the base of the skull as shown by evidences of cranial nerve invasion.

On nodal involvement, 15 patients or 14% exhibited no clinically positive nodes. 61% showed unilateral nodal involvement while 25% had vilateral involvement.

Stage grouping distribution and frequency is shown in Table VI. Stage I and Stage II diseases are limited to the nasopharynx while Stage III and Stage IV report extension beyond the naxopharynx or the presence of metastasis. 99 of the patients or 91% demonstrated tumor extending beyond the nasopharynx with bone involvement or cranial nerve impairment. Only 9 patients had tumors that remained confined to the nasopharynx.

DISCUSSION

Nasopharyngeal malignancy is commonly located in the lateral wall, roof and superior-posterior wall of the nasopharynx. Its clinical manifestations are closely related to the anatomical pecularities of the region, the knowledge of which is mandatory for a better understanding of the disease pattern. Communication exists between the nasopharynx and the posterior choannae, oropharynx, eustachian tubes and the base of the skull. Adjacent to the fossa of Rosenmuller lies the foramen lacerum, providing a route of access to the cavernous sinus and the anterior cranial nerves. Lateral to this lies the jugular foramen and carotid and hypoglossal canals which contains the last four cranial and the sympathetic trunk.

The node of Rouviere, which is the uppermost member of the lateral retropharyngeal nodes of Krause, lies in close proximity to the jugular foramen.

In our series, the symptomatology of nasopharyngeal malignancy revealed features worthy of note. Cervical neck mass was the most common presenting symptom suggesting that our patients were seen in the much later stage. This is further supported by the increased number of patients in Stage IV of Cancer Classification. This is in contrast to the review made by Hopping et al[5] wherien he reported serous otitis media as their earliest complain followed by nasopharyngeal obstruction and bledding.

Nasopharyngeal complaints presenting as obstruction and bleeding comprised a substantial percentage of patients' problem in this review. It would be then beneficial to the patients for us to remember that any history of epistaxis and bloody nasal discharge, correlated with other clinical features might be an indication of malignancy. Thus, a good mirror evaluation and further work-up is necessary.

Serous aural discharge, especially in elderly individuals should not be taken lightly. While otitis media in children maybe a benign nature due to the characteristic anatomical features of the eustachian tube, this however maybe a warning sign of malignancy in adults.

Carlin et al[3] in 1981 reported a case of sudden painless monocular blindness as the initial manifestation of NPC. This was not observed in our series. Instead ophthalmoneurologic problems like diplopia, due to involvement of the 6th cranial nerve was the most common feature.

Although other features of NPC observed in our review were of the non-classicial type, they still merit our attention, since they were observed in our documented cases.

DISCUSSION

The early detection of nasopharyngeal malignancy continues to challenge the clinician. Early recognition and treatment favorably influence survival. This review has presented the clinical profile of NPC in Filipinos. While this may serve as a handbook for the physician, what remains as the best safeguard against misdiagnosis is still the high index of suspicion. Clinical features suggest ive of malignancy demand prompt and conclusive evaluation.

Site	No. of Patients	% of 108
Neck	51	47
Eye	12	11
Ear	12	11
Nose	9	8
Face	9	8
Throat	15	14

Table I Site of Primary Site

Symptoms	No. of Patients	% of 108
Nasopharyngeal		
obstruction	42	39
bleeding	27	25
Otologic		
serous discharge	33	30

tinnitus	18	16
decrease hearing	15	14
Ophthalmoneurologic		
blurring of vision	6	6
diplopia	27	25
drooping of the lids	3	3
Cervical		
mass	84	77
Pain		
head and neck	33	30
Face		
numbness	9	8
paralysis	3	3
Pharynx		
dysphagia	18	16
blood streak expectoration	24	22
horseness	9	8
loss of taste	6	5

Table II Nasopharyngeal Carcinoma Symptoms

Pathologic finding	No. of Patients	% of 108
Poorly differentiated epidermoid carcinoma	48	44
Moderately differentiated squamous cell carcinoma	27	25
Undifferentiated carcinoma	15	14
Epidermoid carcinoma	9	8
Transitional carcinoma	6	6
Anaplastic carcinoma	3	3

Table III Types of Histopathologic Diagnosis

Table IV TNM classification according to the American Joint Committee for Cancer Staging and End Results Reporting

Primary Tumor (T)

T1s	Carcinoma in situ
T1	Tumor confined to one site of the nasopharynx or no tumor visible
T2	Tumor involving two sites (both postero-superior and lateral walls)
T3	Extension of tumor into nasal cavity or oropharynx
T4	Tumor invasion of skull or cranial nerve involvement or both

Nodal involvement (N)

N0	No clinically positive node
N1	Single clinically positive homolateral node less than 3 cm in diameter
N2	Single clinically positive homolateral node 3 to 6 cm in diameter or multiple clinically positive homolateral nodes, none over 6 cm in diameter
N3	Massive homolateral node(s), bilateral nodes, or contralateral nodes

Metastasis (M)

M0	No metastasis
M1	With distant metastasis

Primary Site	No. of Patients	Nodal involvement	No. of Patients
T1s	27	no nodes	15
T1	9	unilateral	66
T2	33	bilateral	27
T3	12	contralateral	0
T4	27		

Table V Classification of malignancies

		No. of Patients	% of 108
Stage I	T1;N0;M0	6	6
Stage II	T2;N0;M0	3	3
Stage III	T3;N0;M0 T1 or T2 or T3;N1;M0	6	6
Stage IV	T4;N0 or N1;M0 any T;N2 or N3; M0 any T; any N; M1	93	85

The Phil.
Jour of Oto.
Head & Neck
Surgery

THE VALUE OF RADIOGRAPHY AND ASPIRATION AS PREDICTORS IN TYPES OF MAXILLARY SINUSITIS

Gil Vicente, M.D.*
Josefino Hernandez, M.D.*
Jose Malanyaon, M.D.**

For an otolaryngologist, one of the commonest daily occurrences is the visit by a patient who declares that he or she has "sinus problems."1 The disfunction of the paranasal sinuses has been blamed for not just one but a variety of symptoms which includes headache, nasal obstruction, post-nasal drip, frequent sneezing, nasal discharge, halithosis and other disturbing symptoms. We have always thought that our knowledge in managing nasal problems has always been adequate and compared to other fields of otolaryngology, we have spent lesser time and effort in this subject. Hence, it is the purpose of this study to take a closer look into this very common clinical entity, its disease pattern and methods of diagnosis which will greatly help us in rendering the most logical management to our afflicted patients.

Sinusitis presents with a rather characteristic group of signs and symptoms depending on the severity and the site of sinuses involved. The maxillary sinus, which is present since birth has been one of the more commonly involved sinuses in this disease. The reason for this is its position as a reservoir for the remainder of the paranasal sinuses with its ostium entering the middle meatus of the nasal cavity in an unfavorable anatomic position. Our clinical eye has been invaluable to us in determining whether we are dealing with an infectious or non-infectious type of sinusitis. Other methods of diagnosis which includes radiography and antral aspiration are perhaps of greater value in our final analysis. Hence, we came up with this local study to confirm this important role.

*Senior Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
**Junior Resident, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.

It should be emphasized further that knowing whether we are dealing with infectious or non-infectious type of sinusitis will help us decide whether to give antibiotics or not to our patient. If in our evaluation we think that we are dealing with a non-infectious type, we could be sparing our patient from spending unnecessarily on costly antibiotics especially during this time of economic crisis. At this point, we should lose no time in working up our patient for allergic clearance. On the other hand, if we are dealing with an infectious type of sinusitis, we then can immediately prescribe the most appropriate antibiotics so we can relieve our patient of their discomfort faster. Therefore, the element of time, money and concern for our patient will always be of paramount importance.

Sinusitis is an inflammatory process of the mucous membrane lining the paranasal sinuses and is either infectious or non-infectious, purulent or non-purulent. According to Zizmor in 1973, sinusitis becomes infectious when bacteria enters the sinus cavity through the ostium and then forming purulent sinus secretion. Other agents such as fungal, parasitic and others may cause this type of sinusitis. But for this study, infectious type will be considered as of bacterial origin, it being the most frequent cause. The non-infectious type is primarily secondary to allergy. This type produces the non-purulent type of secretion (serous or mucoid).

Objectives

The objectives of this study are:

1. to establish the diagnosis of purulent and non-purulent sinusitis using clinical evaluation, sinus radiography and antral aspiration as determinants.
2. to compare our clinical evaluation to that of sinus radiography and antral aspiration in determining purulent and non-purulent sinusitis.
3. to evaluate the use of sinus radiography and antral aspiration in differentiating purulent from non-purulent discharge.

Materials and Methods

A. Selection of Patients

Patients seen at the out-patient department, suspected of having chronic maxillary sinusitis are included in this study, provided that the following criteria are fulfilled:

a. presence of signs and symptoms of sinusitis (feeling of fullness in the face and nose, hypersecretion, headache, nasal obstruction, post-nasal drip, etc.)
b. signs and symptoms are present for more than 2 months.
c. no antibiotic theraphy for at least 2 weeks prior to surgery.
d. radiographic studies are done prior to antrostomy.

B. Methodology

Clinical Evaluation

Patients are initially examined at the outpatient department, taking the clinical history, including the history of allergy, and doing physical examination. The non-infectious type of maxillary sinusitis is established if the patient presents with the history of serous or mucoid discharge and with no purulent discharge noted on physical examination. The infectious type of maxillary sinusitis is established if the patient has had history of purulent discharge and on physical examination, purulent discharge is present.

Purulent discharge is described as opaque, colored yellow or green, and viscous and oftentimes foul-smelling. Serous discharge is transparent yellow and of low viscosity. Mucous discharge is grayish, semi-transluscent and with high viscosity.

Radiographic studies

Paranasal sinuses x-rays taken on the patients were evaluated. Mucosal thickening and the degree of haziness were determined in each case.

They were classified as:

I. Total opacity noted in the sinus. No trace of air is appreciated.

II. Intense opacity,, marked haziness is noted. Mucosal thickening is greater than 0.5 cm. (measured from the lateral wall of the sinus.) A transluscent area is noted at its center.

III. Minimal haziness is noted in the sinus. Mucosal thickening present is less than 0.5 cm.

IV. Normal radiographic findings with no haziness noted.

Those belonging to I and II may be considered as having purulent fluid, while those belonging to III may be considered as having non-purulent fluid. However, some patients in II may have non-purulent fluid especially at the earlier stage of the disease.

Antral Aspiration

Patients were concluded for antrostomy. The nasal cavity was cleaned with povidone iodine soap. Antral puncture was done at the inferior nasal meatus. Aspiration of the antral sinus using gauge 12 Abbocath was performed. Aspirate was classified as purulent or non-purulent. Laboratory examination was done to determine presence of pus or bacterial pathogens in the aspirate.

Results

Thirty-five patients were examined, 20 were males and 15 were females. Age range was from 15 to 65 years with a mean average of 35 years. Median duration of symptoms is four years.

The clincial evidence and radiographic findings are compared in Table 1. Here, we find that 23 patients (I and II) out of the 27 diagnosed clinically to have purulent discharge (85%) have total or intense opacity, while 7 out of 8 clinically diagnosed to have non-purulent discharge (87%) have lesser degrees of haziness or with normal radiographic findings. Statistical studies ($X2 = 15.25$) show that this is significant.

Table 1

Radiographic Findings

Clinical Evidence	I	II	III	IV	Total
Purulent	9	14	4	0	27
Non-Purulent	0	1	5	2	8
Total	9	15	9	2	35

Table 2 shows the comparison between the clinical evidence and antral aspirate. Out of the 27 patients noted to have purulent discharge clincially, 15 had purulent aspirate (55%). Of the 8 clinically diagnosed to have non-purulent discharge, only 2 (25%) had-non-purulent aspirate; the rest had dry antrums.

Table 2

Antral Aspirate

Clinical Evidence	(–)	Non-Purul.	Purul.	Total
Purulent	5	7	15	27
Non-Purulent	6	2		8
Total	11	9	15	35

In Table 3, antral aspirates are compared to radiographic findings. Of the 16 patients with purulent antral aspirates, 15 had total or intense opacity (I and II) (93%). 7 out of 8 with non-purulent fluid on antral aspirate had intense opacity or mucoperiosteal thickening (II and III) (87%). Of the 11 patients with negative aspirate, 6 had mucoperiosteal thickening and 2 had normal radiographic findings. However, 3 patients with total or intense opacity had dry antrums. Also, 1 patient with purulent aspirate had mucosal thickening less than 0.5 cm. These represent false positive (27%) and false negative (6%) respectively.

Table 3

Radiographic Findings

Antral Aspirate	I	II	III	IV	Total
(–)	1	2	6	2	11
Non-Purulent	1	4	3	0	8
Purulent	6	9	1	0	16
Total	8	15	10	2	35

Table 4 shows the relationship of antral aspirate

and history of allergy. 8 out of 8 patients with non-purulent discharge on antral aspiration have allergy. 9 out of 16 patients with purulent aspirate have history of allergy.

Table 4

History of Allergy

		(+)	(−)	Total
Antral Aspirate	(−)	8	3	11
	Non-Purulent	8		8
	Purulent	9	7	16
	Total	25	10	35

Discussion

Several studies have been undertaken to find out the diagnostic acumen of the otorhinologists for maxillary sinusitis. Evans in 1975 reported that they have poor diagnostic ability. Axelsson and Runze in 1976 also concluded that they have a hard time distinguishing maxillary sinusitis from simple rhinitis. In 1981, Berg claimed that their clinical evaluation is fairly reliable.

With our local study, we can perhpas say that clincially the otolaryngologist can fairly recognize the difference between a purulent from non-purulent sinusitis. Our result suggests that only 15 out of 25 (55%) diagnosed clinically with purulent sinusitis had purulent material on aspiration.

There were also several attempts to find out the validity of sinus radiography in determining infectious from non-infectious type of sinusitis.

Vuorinen in 1962 said that there was a fair correlation between sinus radiography and clinical evaluation. Berg concluded that radiologic findings were of limited use and thus offered few advantages. However, Evans reported that sinus radiography is a reliable tool in the diagnosis of maxillary sinusitis.

In our study, there is a fair correlation between our clinical evaluation and sinus radiography. 23 out of 27 (85%) diagnosed to have purulent discharge clinically were considered purulent radiographically. However, out of these 23 patients, only 15 yielded purulent aspirate for a 65 percentage.

We have observed further that there is a good correlation between sinus radiography and antral aspiration. 15 out of 16 (93%) with purulent antral aspirate has had total or intense opacity, and 7 out of 8 (87%) with non-purulent antral aspirate had intense or lesser degree of haziness on radiography.

We have mentioned allergy as one main factor in maxillary sinusitis. Our study shows that of the 35 patients, 25 have a history of allergy. All patients with non-purulent antral aspiration had history of allergy thus confirming our knowledge that non-purulent sinusitis are primarily caused by allergy. For those with purulent aspirate, 9 out of 16 have allergic origin. Their problem could have started as an allergy and later worsened because of chronic inflammation of the mucosa leading to ostial obstruction and eventually resulted in bacterial proliferation.

At this juncture, a review of the pathogenesis of maxillary sinusitis is important.

In the early vascular stage where upper respiratory infection secondary to a virus or to allergy is present, the paranasal mucosal lining is noted to be hyperemic and swollen. There will be ostial obstruction and with increased permeability of vascular endothelium, mucosal edema follows.

In the exudative stage, fluids are then formed. Goblet cells and seromucinous cells are stimulated to produce secretions mainly of serous character. At this stage, clinically, we find serous or mucoid discharge coming out of the maxillary ostia. Radiographically, there would be mucosal thickening and varying degrees of haziness are noted.

This stage may deteriorate to the bacterial stage where there is marked ostial obstruction and hence no fluid draws out of it. The setting for bacterial proliferation begins. This would then cause further mucosal thickening and fluid formation which changes from serous or mucoid type to the purulent type. Clinically, we find purulent discharge and other associated signs and symptoms. Radiographically, the mucosal lining has thickened and opacity has occupied the antrum. Haziness will be noted in a more intense degree.

Our clinical eye may deceive us in our evaluation of maxillary sinusitis. Hence we may overdiagnose or underdiagnose it. The problem perhaps lies in the following.

a) inability of the patients to describe accurately to the doctor the kind of nasal discharge they have

b) inability of the doctor to elicit a good history of the kind of discharge

c) failure of the doctor to distinguish accurately between purulent and non-purulent discharge on physical examination

d) lack of definite criteria in determining purulent from non-purulent discharge.

Really, it may be hard on the part of the doctor and more on the patient to distinguish the type of discharge. A mucoid discharge may appear purulent and vice versa. In cases of presence of polyps where the maxillary ostium as well as the discharge coming from it cannot be properly evaluated, the doctor may just rely on the patient's history. Also, the discharge he may be seeing is not after all coming from the maxillary sinus.

Radiologic studies is valuable in predicting infectious from noninfectious type. It complements our antral aspirate findings. However, there may be some false negatives and false positives as shown in Table 3. This may be due to the following:

a) technical error in taking the radiographic studies

b) superimposed structures which add haziness to the field

c) scanty amount of fluid which may not be readily distinguished on X-ray. This possibly explains the negative aspirate inspite of radiographic findings of mucosal thickening and haziness as shown in 6 patients. See Table 3).

d) time element, that is, there may be remarkable changes that took place inside the antrum from the time the X-ray was taken up to the time of antral aspiration.

It should be noted that clinical evaluation greatly improves with the help of sinus radiography.

Antral aspiration perhaps offers us the best advantage of determining purulent from non-purulent discharge. It is easy to perform and is very informative. Here, we can clearly and properly evaluate the contents of the antrum and have it analyzed for any pus or bacterial pathogens. Laboratory results confirm the presence or absence of pus in purulent and non-purulent antral aspirate.

In summary, our clinical evaluation gives us a fair correlation with the type of maxillary sinusitis. Sinus radiography is a useful guide in our determination. But antral aspiration offers the most comprehensive diagnostic basis for predicting infectious and non-infectious type of maxillary sinusitis.

With this knowledge as a backgrounder, perhaps we can now give the most logical management to our patients with sinus problem. And the impact will be great that you will leave the impression that there is one good otolaryngologist around.

BIBLIOGRAPHY

1. Berg, O., Bergstedt, H., et al. Discrimination of Purulent from Nonpurulent Maxillary Sinusitis. Annals of Otology, Rhinology and Laryngology, 90: 1981, pp. 272-275.
2. Carenfelt C. The Pathogenesis of Sinus Empyema. Annals of Otology, Rhinology and Laryngology. 88: 1979, pp. 16-20.
3. Evans, F.O., Sydnor, J., Moore, W., et al. Sinusitis of the Maxillary Antrum. New England Journal of Medicine. 293: 1975, pp. 735-739.
4. Karma, P., et al. Bacteria in Chronic Maxillary Sinusitis. Archieves of Otolaryngology, 105: 1979, pp. 386-390.
5. Van Nostrand, A.W., Goodman, W.S., Pathologic Aspects of Mucosal Lesions of the Maxillary Sinus. Otolaryngologic Clinic of North America. 9:21, 1976.
6. Vuorinen, P., Kauppila, A., Pulkkinee, K. Comparison of Results of Roentgen Examination and Puncture and Irrigation of the Maxillary Sinuses. Journal of Laryngology and Otology. 76: 1962, pp. 359-364.
7. Yanagisawa, E., Smith, H. Normal Radiographic Anatomy of the Paranasal Sinuses. Otolaryngologic Clinic of North America, 6: 1973, pp. 429-456.
8. Zizmor, J., Noyek, A. Inflammatory Diseases of the Paranasal Sinuses. Otolaryngologic Clinics of North America. 6: 1973, pp. 459-473.
9. Boiese and Paparella. Fundamentals of Otolaryngology.

The Phil. Jour of Oto. Head & Neck Surgery

SILVER NITRATE STICK FOR RECURRENT AND RESIDUAL NASAL POLYPS: A REDISCOVERY*

Bernie Singson, M.D.**
Rodolfo Nonato, M.D.***
Jose Malanyaon, M.D.**

Introduction:

Sinusitis with nasal polyps is one of those diseases that is still perplexing to the otolaryngologist as regards definitive management leading to long lasting or permanent cure. Patients usually come to the otolaryngologist with the hope that relief or cure can be obtained by medical treatment or by a single nasal surgical procedure. However, when confronted by patients suffering from this condition, no real otolaryngologist can give specific guarantees to that effect. Moreso, if the polyp has an allergic background or is recurrent in nature.

A good number of patients with residual or recurrent nasal polyps tend to shy away from a second operation. Especially if the previous operation has just been performed a few months before. Faced with this problem, we entertained the possibility of a less invasive alternative solution. Thus, we undertook to study the possibility or effectiveness of using silver nitrate stick cautery in residual or recurrent polyps. It is the aim of this study to determine if the said procedure can minimize or eliminate this problem. At the minimum, we were satisfied if we can even just relieve the nasal obstruction caused by the residual or recurrent polyp. Yes, we are aware that there is no substitute for a complete and thorough ethmoidectomy but we feel that all of us have encountered this problem one way or the other.

*1st Prize

**Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
***Formerly Chief Resident, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.

Materials and Methods

Adult patients from the outpatient department of the Philippine General Hospital were selected at random based on the following criteria:

1) History of previous nasal surgery (polypectomy with ethmoidectomy and antrostomy with or without Caldwell-Luc operation).

2) Presence of residual or recurrent polyp on physical examination.

3) Cooperative and promises to have regular check-ups.

A total of 14 patients were included in the series with ages ranging from 19 to 55. No attempt was made to determine the etiology of the polyp nor to differentiate whether it is residual or recurrent in nature.

The nostrils of all patients were routinely decongested using ephedrine sulfate solution 1:1000. In 4 patients with low pain threshold, xylocaine 4% was added to the decongestant at 1:1 dilution. Silver nitrate stick was used to cauterize the polyp. There were 2 types of silver nitrate sticks used, the commercially available one which has a plastic handle and the match stick type. In the latter type, the silver nitrate is like a match head placed on an applicator stick. As for the former type, it is pulverized and held in place by a nasal dressing forcep for greater control of area of application to avoid injury to the surrounding mucosa. Cautery was done on a weekly basis until the polyps disappear or no change was perceptible in the size after 3 to 4 applications.

Pertinent clinical data regarding signs and symptoms, change in size of the polyp, number of applications, and duration of treatment were recorded.

Results were evaluated according to the classification as listed in table I.

Discussion

Recurrent and residual nasal polyps are disturbing to the patient and to the otolaryngologist as well. Its management often requires at least a second surgery and of course anxiety to the patient. Although it is frequently encountered in ENT practice, at the moment, there is no steadfast rule regarding its management.

Table II shows the age and sex distribution of the patients included in this series. Whether this data indicate a definite age and sex predilection is something beyond the scope of this study.

Table III A shows the presenting symptoms of the patients. All 14 patients did complain of nasal obstruction with headache present in 8. These same symptoms were evaluated after completion of treatment as shows in table III B. Nasal obstruction was relieved in 12 patients, diminished in 1 and persisted in 1.

Headache was relieved in 7 and one patient had persistent headache even after treatment.

Tables IV and V show the results of this study including the number of applications and duration of treatment. The single poor result was already a big polyp when initially seen. Unfortunately, the silver nitrate stick did not work. This indicates that the polyp should not be large enough to cause almost total nasal obstruction since the stick should as much as possible cauterize most of the surface area of the polyp.

All our patients had regular follow-up such that with slight evidence of recurrence, silver nitrate stick is immediately utilized to cauterize the polyp, thereby giving no opportunity for the polyp to grow big. The longests period of follow-up among the patients was 2 years. This patient had undergone 12 repeated nasal surgeries because of recurrent nasal polyps prior to this study. With silver nitrate stick application, the patient is free of recurrences for 2 years now.

Application of silver nitrate stick ranged from 2 to 6 times. But one observation noted was that with a single application, polyps undergo dramatic decrease in size. The silver nitrate stick was applied on a weekly basis, and the end point of application is when the previous site of polyps is covered by healthy-looking mucosa on subsequent follow-up.

The patients complained of nasal pain and headache a few minutes after silver nitrate stick cauterization. This is managed by giving oral analgesics. Some patients experienced epistaxis, but all were not severe enough to warrant intervention. One patient developed turbino-septal adhesion, but managed easily by lysis of the adhesion under local anaesthesia.

This study showed that silver nitrate stick can delay recurrences of nasal polyps. Silver nitrate solution at 10 to 15% concentrations can be used, but dramatic result is obtained with the stick even with single application. With silver nitrate stick application, the polyps become whitish and just drop off with nasal blowing after a day or two. With the small multiple polyps at the area of the ethmoids and uncinate process of the middle turbinate, silver nitrate stick is easily applied, and cautery of these areas result in disappearance of the polyps and replaced by healthy looking mucosa in a week's time.

"Nasal polyps possess edematous framework of fibroblasts with abundant interdigitating cytoplasmic processes, a plexus of inflamed blood vessels, and a mixed infiltrate of active inflammatory cells." Basically, it is made of protein substances. So, with silver nitrate stick cautery, the protein components break down and undergo necrosis and eventually peel off as a result of the breakdown of the fibroblasts which give support and firmness to the polyp.

In conclusion, this study documents that silver nitrate stick cautery can be an added armamentarium of the otolaryngologist in dealing with recurrent and/or residual nasal polyps, especially in small ones. Except for some minor complaints like headache, which is readily relieved by giving oral analgesic, this procedure was found to be less invasive and does not require hospitalization. However, to really avail of this procedure, it requires the close cooperation and regular follow-up of the patient. Definitely, this procedure is effective if the polyps are detected at an early stage.

TABLE I: Classification of Results After Silver Nitrate Stick Application

Excellent: Relief or decrease of symptoms and absence of polyp.
Good: Relief or decrease of symptoms and decrease in size of polyp.
Fair: No relief of symptoms and decrease in size of polyp.
Poor: No relief of symptoms and no change in size or increase in size of polyps.

TABLE II: Age and Sex Distribution

AGE	MALES	FEMALES	TOTAL
19-30	3	7	10
31-40	-	3	3
40		1	1
TOTAL	3	11	

TABLE III: A: Symptomatology

Symptoms	Number of Patients
1) Nasal obstruction	14
2) Headache	8

TABLE III: B: Symptoms After Silver Nitrate Stick Treatment

Symptoms	Number of Patients		
	Relieved	Diminished	No Response
1) Nasal obstruction	12	1	1
2) Headache	7		

TABLE IV: Number of Application and Duration of Treatment

Patient	Number of Application	Duration of Treatment
1) E.M.	more than 10 times	2 years
2) R.S.	2	2 weeks
3) T.M.	2	2 weeks
4) S.S.	3	3 weeks
5) L.C.	6	6 weeks
6) A.T.	5	5 weeks
7) E.P.	3	3 weeks

8)	A.G.	3	3 weeks
9)	E.R.	3	3 weeks
10)	T.V.	4	4 weeks
11)	C.M.	3	3 weeks
12)	E.C.	2	2 weeks
13)	R.G.	3	3 weeks
14)	A.R.	4	4 weeks

NOTE: All patients are still on regular follow-up, if with sign of recurrence, silver nitrate stick application is immediately done.

TABLE V: Results After Silver Nitrate Stick Treatment

	Patient		Results
1)	E.M.	Good	decrease in size of polyp
2)	R.S.	Excellent	absent polyp
3)	T.M.	Excellent	absent polyp
4)	S.S.	Excellent	absent polyp
5)	L.C.	Excellent	absent polyp
6)	A.T.	Excellent	absent polyp
7)	E.P.	Excellent	absent polyp
8)	A.G.	Excellent	absent polyp
9)	E.R.	Poor	no change in size
10)	T.V.	Excellent	absent polyp
11)	C.M.	Excellent	absent polyp
12)	E.C.	Excellent	absent polyp
13)	R.G.	Excellent	absent polyp
14)	A.R.	Excellent	absent polyp

Bibliography

1. Bernstein, Leslie: *Symposium on the Nasal Cavities.* Otolaryngologic Clinic of North America. 6 (3), Oct. 1973.

2. Bhargava, K.B.: *Treatment of Allergic and Vasomotor Rhinitis by the Local Application of Silver Nitrate.* The Journal of Laryngology and Otology, 94: Sept. 1980, pp. 1025-1036.

3. Bunstil, Anthony, et. al.: *Ultrastructure of the Stroma of Nasal Polyps.* Arch of Otolaryngology, 102: pp. 589-595.

4. Marshall, Jay and Schneider, Richard: *Systemic Argyria Secondary to Topical Silver Nitrate.* Arch Dermatology, 113: Aug. 1977, pp. 1077-1079.

5. Reyes, Carlos, et. al.: *Bisolvonat in Paranasal Sinusitis.* Journal of the Philippine Medical Association, 53 (3-4): March-April 1977.

The Phil.
Jour of Oto.
Head & Neck
Surgery

INTRAOPERATIVE NERVE STIMULATOR* (A SIMPLE MICROELECTRONIC APPLICATION)

Edmundo Falcon, M.D.**
Felix Nolasco, M.D.***

Introduction

Certain applications of electronics into the field of medicine have been around long enough that most of us are well-acquainted with its impact. Since the time Alexander Volta discovered electricity till Luigi Galvani discovered bioelectric potential in frog muscle preparation, the use of electronics in medicine has, as in other fields increased quite rapidly and we now encounter such impressive terms as Hilger nerve stimulator, electromyography, electrogustometer and electroneurography. All of these are special equipment needing tantamount investment for an ordinary otolaryngologic practice. Aside from expensive and not so available maintenance, repair during breakdown is furstrating because of unavailable parts. In spite of technological advances in electronics within our reach, no one bothered to take advantage of the opportunity.

This project explores the possibility of developing an invaluable nerve stimulator using the latest integrated circuit known as "chip" which is available in the local market. At the same time, the design is based on a sound bioengineering method and electronic design technique available in the literature.

Basic Theory

Extensive electrophysiological studies have yielded that the muscle and nerve tissues produce bioelectric potential in response to stimulation. It was shown that this stimulus could be mechanical, thermal and electrical. However, electrical stimulation gained popularity because it can be measured, quantified, easily controlled and available. Studies by several investigators came up with standardized stimulating parameters to be used in nerve stimulation. Ko has summarized these parameters as seen in Table 1.

Table 1 Stimulating Parameters

	Nerve		
Pulse width	0.05	– 1	milliseconds (ms)
Pulse rate	5	– 100	pulse per second (pps)
Pulse voltage	0	– 10	volts (V)
Pulse current	0.1	– 10	milliamperes (mA)

Ko, W.H.[7]

Materials and Methods

A. Instruments

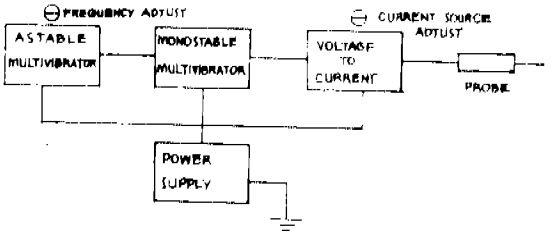
The design of the internal circuit requires the following test instruments for measurement, wave form analysis and troubleshooting.

1. Oscilloscope for waveform measurement and analysis;
2. VOM (volt-ohm meter) for voltage, resistance and current measurement;
3. Breadboard for prototyping and experimenting the actual circuit;
4. Accessory tools like minidrill, soldering iron, wire stripper, vise grip, pliers, screw drivers and a scientific calculator.

B. System Operation

The basic operation of the intraoperative nerve stimulator is shown in five functional block diagrams. (See Figure 1.) The design and system operation of this instrument was based upon the stimulating parameters shown in Table 1.

Figure 1



It will be elucidated as follows:

1. ASTABLE MULTIVIBRATOR provides the frequency adjustment in pulse per second (pps). It ranges from five to one hundred pulse per second by simple knob adjustment. Figures 2a and 2b show the waveform of five pulse per second and one hundred pulse per second respectively. However, the waveform has a variable pulse width.

*1st Prize
**Junior Resident, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
***Formerly Senior Resident, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.

Figure 2a

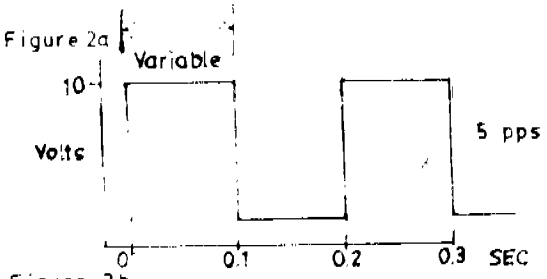
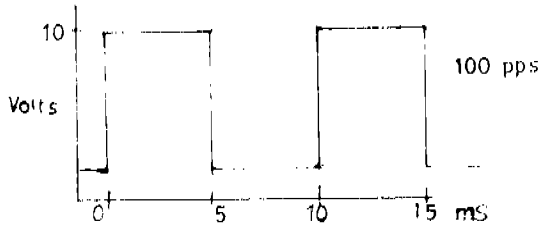


Figure 2b



2. MONOSTABLE MULTIVIBRATOR produces a constant pulse width of one milliseconds in spite of changes in pulse rate.
3. CONSTANT CURRENT SOURCE serves as impedance matching and voltage to current conversion regardless of variation in skin resistance and environmental temperature.
4. The PROBE is made up of stainless steel so as to satisfy stringent bioengineering requirements like minimal corrosion in the body regardless of usage good fatigue resistance, minimal body reaction to limit the increase threshold, sterilization and availability. The surface area of the probe tip is small to be point specific during stimulation.
5. POWER SUPPLY provides the necessary AC to DC power conversion, regulated at ten volts. It also isolates the instrument, the patient and the surgeon from the dangerous power line. Provision for nine volts battery operation is available in case of brownouts.

C. Cost

The instrumetn designed made use of the following components locally available with their prevailing price. (See Table 2.)

Table 2 Cost

Unit	Quantity	Price
Integrated Circuit	3	P38.00
Transistors	2	P12.20
Diodes	5	P 7.10
Capacitors	9	P28.50
Transformer	1	P14.00

Table 2 Cost

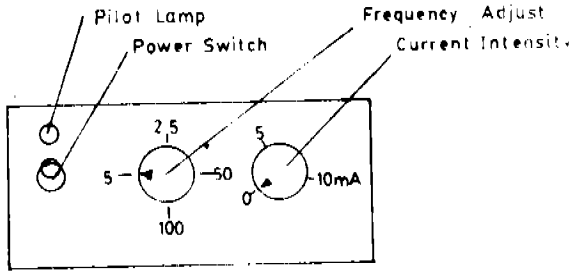
Unit	Quantity	Price
Integrated Circuit	3	P 38.00
Transistors	2	P 12.20
Diodes	5	P 7.10
Capacitors	9	P 28.50
Transformer	1	P 14.00
Miscellaneous	–	P267.40
	Total Cost	P388 00

D. Instrument

The front panel of the instrument shown in Figure 3 will be described as follows:

1. POWER SWITCH controls the power supply of the instrument;
2. PILOT LAMP monitors the presence of power;
3. FREQUENCY ADJUST controls the frequency in steps of five, twenty five, fifty and one hundred pulse per second;
4. CURRENT INTENSITY controls the current pulse from zero to ten milliamperes.

Figure 3



E. Clinical Trials

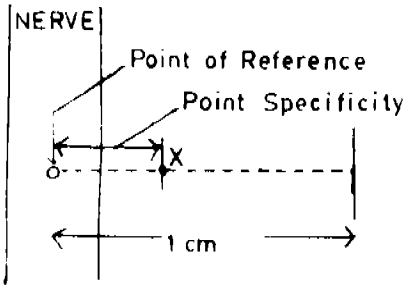
The objective of the clinical evaluation is to determine the following:

1. That the instrument will work as designed;
2. That it is safe and simple to use;
3. That the stimulation is reliable, (i.e.) only the tissue in contact with the probe is stimulated.

A total of ten patients who underwent facial nerve decompression and partodectomy were used subjects. After careful identification of the nerve, electrical stimulation was done by gradual current increments until visible contractions were noted on the muscle supplied by the nerve. Reliability was evaluated using the point specificity. Point specificity is the distance from a structure (nerve or muscle) where stimulation occurs. With the initial point previously stimulated as a point of reference as shown in Figure 4, a distance of one centimeter away was arbitrarily chosen as the starting point in stimulation. The probe was moved gradually towards the point of reference till the same contractions was noted in the point of reference. This distance, X, from the point of

reference is called point specificity. A small distance means a reliable stimulation.

Figure 4



Post-operatively, the patients were clinically evaluated for possible residual damage attributable to electrical stimulation. Patients who underwent nerve sacrifice after nerve stimulation were excluded for obvious reason.

F. Results

The instrument was tested in ten operations. Table 3 shows the diagnosis of the patients, operation performed, point specificity and the possible complications due to electrical stimulation. In all patients, nerve stimulation was successfully achieved. The point specificity averages to 0.18 centimeters, meaning that the instrument is reliable enough under clinical condition. The operations were performed by four different surgeons, including the consultant adviser of this project and they found the stimulator easy to use.

Discussion

With the advent of microelectronics and solid state technology, a vast of new application ideas in medical instrumentation crop up, which may in one way or the other become invaluable in our day to day practice. Given the proper background, test instruments, incentives and a lot of drive, anyone can develop an instrument of comparable quality even without an engineering degree, as exemplified by this project.

Intraoperative nerve stimulator deserves credit as an invaluable aid for the head and neck surgeon who is occasionally flustered by an aberrant nerve waiting to be cut accidentally despite experience. This instrument is functional, reliable and easy to use. Comparing this instrument with other commercially available foreign instruments, there seems to be no difference regarding to function but it is considerably cheaper. A Hilger nerve stimulator cost about $500.00 dollars, equivalent to P7,000.00 pesos while this instrument costs only P600.00 pesos with a savings of P6,400.00 pesos. This means not only a personal savings but also helps the country in conserving our dollar reservers.

In addition, the instrument is flexible enough for long battery operations, especially in our brownout-ridden community because it consumes a very small amount of power. Just like any other instrument, breakdown is expected after years of service. However, repair and troubleshooting is not a problem because the components used are industry standard so it is available from different manufacturers.

Notwithstanding, this instrument has other poten-

Table 3 Results

Diagnosis	Operation	Point of specificity*	Complication
CTM (L) with FN paralysis	Radical Mastoidectomy	0.0 cm	none
Parotid Tumor	Superficial Parotidectomy	0.2 cm	none
Parotid Tumor	Superficial Parotidectomy	0.1 cm	none
CTM with subperiosteal abscess (R)	Radical Mastoidectomy	0.2 cm	none
Parotid Tumor	Superficial Parotidectomy	0.3 cm	none
Parotid Tumor, recurrent	Total Parotidectomy with FN sacrifice	0.1 cm	not included
Parotid Tumor probably Ca	Total Parotidectomy	0.2 cm	not included
Parotid Tumor	Superficial Parotidectomy	0.4 cm	none
CTM (AU) with cholesteatoma	Radical Mastoidectomy	0.2 cm	none
Parotid Tumor probably Ca	Total Parotidectomy	0.1 cm	not included
	Average . . .	0.18 cm	

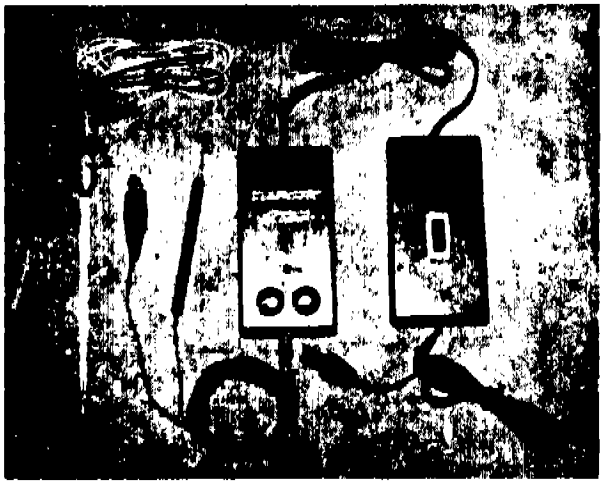
*approximations

tial uses depending upon the imagination of the user. It could be used as an electrogustometer instead of the usual salt and sugar during facial nerve topognostic examination. By combining the probe and ground into a bipolar needle, it can be used in electromyography, nerve excitability testing and nerve conduction velocity measurement.

So much was said about the instrument, hopefully this projects will titillate someone's imagination into developing his own instrument.

References

1. Geddes, L.A. and Baker, L.E. *"Principles of Applied Biomedical Instrumentation,"* John Wiley & Sons, Inc. New Yor, 1968.
2. Clynes, M. and Milsum, J. (eds) *"Biomedical Engineering."* McGraw-Hill Book Co., New York 1970.
3. Plonsey, R. *"Bioelectric Phenomena,"* McGraw-Hill Book Co., New York.
4. Dummer, G.W.A. and Robertson, J.M. (eds.) *"Medical Electronic Equipment,"* Pergamon Press, New York, 1970.
5. Thompson, R.F. and Paterson, M.M. *"Bioelectric Recording Techniques,"* Academic Press, New York and London.
6. Strother, G.M. *"Physics with Application in Life of Sciences,"* Houghton Mifflin Co., Boston.
7. Fink, D.G. (ed.) *"Electronic Engineers Handbook,"* McGraw-Hill Book.Co., New York, 1975.
8. Linear Application Handbook, National Semiconductor, 1980.



The Phil.
Jour of Oto.
Head & Neck
Surgery

MASTOID CAVITIES GRAFTED WITH TEMPORAL FASCIA*

Edgardo C. Rodriguez, Jr. M.D.**

Introduction

Unlined cavities following surgery on the mastoid, for the most part, would account perhaps for the delayed healing time. At the Hospital ng Maynila, where a lot of mastoidectomies are still being done, an average of 130.9 days was required for complete drying up. (See Table I). All patients included in this study were radiographically positive for cholesteatoma.

TABLE I

Patients	Otoscopically Dry
O.P.	57 days
N.M.	97 days
E.M.	91 days
A.G.	150 days
C.I.	196 days
R.P.	86 days
R.P.	96 days
P.B.	300 days
E.R.	83 days
E.G.	153 days
	1,309 days
Average:	130.9 days

*3rd Prize

**Consultant Otolaryngologist, Hospital ng Maynila.

The varying healing time may well be ascribed to other factors like.

1) faulty technique
2) poor post operative-care
3) impaired host immune system

In a busy outpatient clinic, prolonged healing time that requires too many follow-up visits for post-op-care further aggravate and already over crowded outpatient clinic.

In an attempt to ease up the patient load at the ENT Outpatient clinic, a study was conducted to determine the usefulness of lining up the mastoid cavity with temporal fascia.

Materials and Methods

Seven (7) cases of chronic tympanomastoiditis radiographically positive for cholesteatoma were selected for surgery with temporal fascia lining the mastoid cavity. The drying time of the operated ears were noted and recorded. These series of 7 cases were compared with 10 cases of previously operated ears with an unlined mastoid cavity.

OPERATIVE TECHNIQUE – Removal of Temporal Fascia – A 4 cm. incission is made horizontally above the ear beginning 0.5 cm. above the anterior margin of the crus helices, dissecting down to the temporal fascia which should be stripped off of loose areolar tissue. The dissection is facilitated if ample local anesthesia has been injected to balloon the area. By lifting the retractor, loose areolar tissue may be pulled away from the fascia facilitating the dissection. A 3 x 2.5 cm. piece of fascia is removed. Fascia is cleaned by removing the adherent muscle and subcutaneous tissue. Incission is then continued inferiorly a few millimeters from the sulcus and the standard operation is performed.

After cleaning the mastoid cavity and the operation is just about completed, the fascia obtained is lined into the mastoid cavity. Antibiotic ointment is placed over the fascia and the drain left in place.

Removal of the drain is made after 5 to 7 days and follow up is made 2x a week for the first and second week; once a week after the third and fourth week.

RESULTS

TABLE II

CASES GRAFTED WITH TEMPORAL FASCIA

Cases	Patient	Age	Operated Ear	Otoscopically Dry
1	N.R.	60	AD	27 days
2	J.A.	7	AS	22 days
3	M.B.	22	AS	21 days
4	A.A.	17	AD	17 days
5	A.L.	17	AS	27 days
6	A.B.	8	AD	26 days
7	B.Y.	8	AS	24 days
				164 days

Average: 23.4 days

Discussion

There has been so many studies in the past which dealt mainly on the skin lining the mastoid cavity. Zwerling claims that with the use of the Brown electrodermatome, Mastoid cavity lined with split thickness graft, healing time was shortened.[2] Their study of 5 cases revealed shortened healing time in 3 weeks. Another study by Withers revealed a dry-epithelialized cavity in 9.3 weeks in primary grafted cases as compared to 25.6 weeks in ungrafted control group.[3] Campbell in his study revealed early drying of ears in 6 weeks to 3 months.[4] Skin grafting were tried during the 1950's and its advantages were noted. (See Table III)

We chose temporal fascia as our graft material because of its low metabolic rate and subsequently has a good survival prospect.[5] Fascia is also readily available and it also serves a good training for our projected plan to go into tympanoplasty.

TABLE III

SKIN GRAFTED CASES

	No. of Patients	Otoscopically Dry
Zwerling	5	3 weeks
Campbell	50	6 weeks
Wither	46	9.3 weeks

The 7 cases included for grafting with temporal fascia were randomly picked. Five (5) of them showed cholesteatoma occupying the mastoic cavity. Two cases showed sclerotic mastoid.

It was observed that the drying time has shortened considerably against the classical procedure.

Conclusion

Temporal fascia lining the mastoid cavity shortens the drying time considerably compared to those without fascia lining from 18.7 weeks or 130.9 days to 3.3 weeks or 23.4 days.

Bibliography

1. Sheehy, J.L.: *Surgery of Chronic Otitis Media in Otolaryngology.* Haperstown, Maryland, Harper & Row Publishers Inc., 1972 Vol. 2 Ch. 10.
2. Zwerling, M.H.: *Primary Skin Grafting of Radical Mastoidectomy Cavities With Brown Electrodermatome.* A.M.A. Archives Of Otolaryngology, Vol. 56 No. 1: August 1952, pp. 161-171.
3. Withers, B.T. *Primary Grafting of Fenestration and Mastoidectomy Cavities.* Archives of Otolaryngology Vol. 63 No. 3: March 1956, pp. 248-251.
4. Campbell, E.H.: *Radical Mastoidectomy With Primary Split Thickness Skin Grafting.* Archives of Otolaryngology. Vol. 61 No. 2: p. 159-163. Tel. 1955
5. Ballentyne,

The Phil.
Jour of Oto.
Head & Neck
Surgery

HEARING DEFECT AMONG CHILDREN WITH DOWN'S SYNDROME*

Gerardo Fronda, M.D.**

Introduction:

Children with Down's syndrome have a higher than normal incidence of hearing loss but little unanimity exists regarding the incidence or nature of the hearing problem.

Down's syndrome or mongolism is the result of chromosomal abnormality either as a 21-trisomy, a translocation trisomy, or as mosaicism. It is one of the most common of the clinically classifiable categories of mental retardation. The incidence is estimated at 1.5 per 1,000 births and accounts for approxiamtely 10 per cent of retarded individuals in institutions. Their characteristic personality is warm, friendly and affectionate and mental retardation is almost universal in Down's syndrome children. The ear is characteristically described as small pinnae, narrow external auditory canals, abnormal external ear configuration and strong tendency for otitis media because of the high incidence of upper respiratory tract infection.

Local studies on abnormalities among schoolchildren have shown that hearing defects comprised the third most common abnormality. There is, however, no correlation done with mental retardation as well as to the incidence or nature of the hearing problem. In line with this concern for the mentally retardates, specifically Down's syndrome, a study was initiated with the following objectives:

1. To identify the type or nature of hearing loss among children with Down's syndrome.
2. To determine the useful battery of tests in Down's syndrome.
3. Finally, to determine whether deafness in Down's syndrome is a factor in their rehabilitation.

MATERIALS AND METHODS

From a study done at a local hearing center, four basic audiometric tests done for children with Down's syndrome as:

1. Phonak Selector
2. Free Field Test
3. Play Audiometry
4. Impedance Audiometry

The study population consists of 16 subjects with Down's syndrome from January 1982 to September 1983. Ages ranging from 5 years old to 15 years old. Ten are males and 6 are females.

RESULTS:

Audiogram records of sixteen subjects with Down's sysndrome was perused and showed the following results:

1. Fourteen showed sensorineural loss (87.5%)

   10 - bilateral
   4 - unilateral

2. Two showed conductive hearing loss associated with otitis media. (12.5%)

Table I shows the results of the battery of tests done on patient H.K., 6 year old, M.

1. Phonak Selector – child localized to 50 dB warble sounds presented at 1, 2 & 4 kHz on the right ear and at 70 dB warble sounds on left ear presented at same frequencies.
2. Free-Field Test – child responded by name calling at 50 dB and to tones and different noisemakers presented.
3. Play Audiometry – child could not follow the required audiometry task.
4. Impedance Audiometry
   a. Tympanometry – Type A, both ears indicating no middle ear pathology
   b. Acoustic Reflex test:

	500	1000	2000	Hz
R.E.	95	100	100	
L.E.	ABS	ABS	ABS	

From the results of the above mentioned battery of tests done, it is in conformity that the patient has a normal hearing sensitivity on the right ear and a moderate sensorineural hearing loss on the left ear.

Table II shows results of audiometric test of R.J., 5 years old, M.

1. Phonak Selector – child localized to 70 dB

*Consolation Prize
**Resident, Dept. of E.N.T., U.S.T. Faculty of Medicine & Surgery

warble tones on the right ear and 90 dB on the left ear presented at 1, 2, & 4 kHz.

2. Free-Field Test – responded to different noisemakers at 50 dB.
3. Play Audiometry – child could not be conditioned.
4. Impedance Audiometry
   a. Tympanometry – Type A, both ears indicating no middle ear pathology
   b. Acoustic reflex - absent at 1000 & 2000 Hz

Results of the above mentioned tests suggest that the patient has a moderately severe sensorineural hearing loss on the right ear and a severe sensorineural hearing loss on the left ear.

Table III shows audiometric tests done on P.O., 15 years old, F.

1. Phonak Selector – patient responded at 70 dB warble tones presented at 1000, 2000 and 4000 Hz on both ears.
2. Free-Field Test - patient responded at 70 dB to tones and other noisemakers presented.
3. Play Audiometry – patient could not follow the desired auditory task.
4. Impedance Audiometry:
   a. Compliance - 0.5 cc on both ears
   b. Tympanometry – Type B, both ears indicating possible perforation or fluid-filled middle ear cavity.

In view of the findings the patient has a bilateral severe to profoundshearing loss with conductive components as shown by type B tympanogram.

DISCUSSION:

Lately, the Ministry of Education, Culture and Sports (MECS) has identified a total of 108,754 handicapped and gifted children thoughout the country as of last year. Almost 50% – 49607 – were found mentally retarded or slow learners while 39,740 were gifted or fast learners.

These local studies on handicapped and gifted schoolchildren have shown that hearing defect ranks third as the most common abnormality.

To date, however, no local study has been done in correlation with mental retardation and types of hearing defects among Down's syndrome.

Glovsky (1966) reported that only 2 out of 38 Down's syndrome childrne had normal hearing, for an incidence of hearing impairment of 95% with sensorineural type being the prevalent type. Fulton & Lloyd (1968) reported conductive type of hearing impairment to be dominant. University of Colorado Medical Center found out 15 per cent bilateral normal hearing, 50 per cent conductive hearing loss and 15 per cent sensorineural hearing loss.

Results of my study of 16 subjects from January 1983 to September 1983 showed 14 sensorineural type of hearing loss while 2 showed conductive type of hearing loss.

CONCLUSION:

Based on the 16 cases, sensorineural hearing loss is the predominant type of hearing defect among children with Down's syndrome.

The useful audiometric test for children with Down's syndrome are Phonak Selector, Free-Field Test and Impedance Audiometry.

Early amplification may be helpful in the rehabilitation of children with Down's syndrome.

Jordan (1972) pointed out that even a mild degree of hearing loss may have disproportional impact on the mental retardate because he is less capable of compensating cerebrally with the aid of his other senses.

1982 was the "Year of the Disabled." Any coworkmanship that might be utilized for the enhancement on the growth and develòpment of these affected individuals will be of greate value. After all, these people, the children with Down's syndrome should not be deprived of their needs.

REFERENCES

1. Fulton, R & Lloyd L., Hearing impairment in a population of children with Down's syndrome. Am. J. Ment. Defic. 73: 1968, pp. 293-302.
2. Glovsky L., Audiological Assessment of a Mongoloid Population. Trng. Sch. Bull. 33:27, 1966.
3. Jordan, O. Mental Retardation and Hearing Defects. Scand. Audiol. 1:1, 1972, 29-32.
4. Keith, Robert W. Audiology for the Physician. 1980, pp. 171-185.
5. MECS, Study on Schoolchildren 1983. Bulletin Today, Aug. 17, 1983, p. 7.
6. Vaughan, Victor C, III. Nelson's Textbook of Pediatrics. 10th ed., 1975, pp. 134-138.

The Phil.
Jour of Oto.
Head & Neck
Surgery

RELIABILITY OF THE CONVENTIONAL MASTOID X-RAYS IN CHRONIC TYMPANO-MASTOIDITIS WITH CHOLESTEATOMA

Apollo Garcia, M.D.*
Jan Lopez, M.D.*
Cesar Villafuerte, Jr., M.D.**
Victoria Casimiro**
Felix Nolasco, M.D.*

I. INTRODUCTION

The study of the temporal bone has always been a challenge to both otologists and radiologists. On one hand, because of the different densities of its bony compartments and the air-fluid spaces in and around them, the temporal bone lends itself to radiologic assessment. On the other hand, the concentration in such a small space of many important structures makes the investigation quite difficult.

Films must be taken in positions designed to reveal lesions in the key attic-additus-antral area which in this case is chronic tympanomastoiditis with cholesteatoma.

Schuknecht defined cholesteatoma as the accumulation of exfoliated keratin in the middle ear and mastoid arising from keratinizing squamous epithelium. The otologist who not only knows the clinical course of the disease in a particular patient but, who can correlate the radiologic changes with the lesions seen intra-operatively is in a favorable position to interpret and correlate the radiologic findings of the ear and mastoid based on his surgical experiences.

Unfortunately, some authors have shed some doubts on the reliability of mastoid x-rays. They find x-rays of the mastoid unnecessary, of little help in determining the extent and dimensions of the cholesteatoma, and not reliable in excluding the presence of cholesteatoma. This raises the question – Does it help us and the patient in any way if ever we request for it?

*Formerly Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
**Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.

II. Objectives

The objectives of this study are:

1. To correlate the official conventional radiologic interpretations and surgical findings in patients with chronic tympanomastoiditis with or without cholesteatoma.

2. To determine, based on these findings, the specificity and sensitivity of conventional mastoid x-rays in evaluating patients with cholesteatoma.

III. Materials and Methods

This is a one-year prospective study of patients with chronic tympanomastoiditis admitted into the Department of E.N.T.-UP-PGH from September 1982 up to September 1983. Included were 85 patients with and without an impression of cholesteatoma. Pre-operative mastoid x-rays consisting of an antero-posterior, lateral, and oblique views were taken for each case. Correlations of the radiologic and clinical impressions were done intra-operatively by direct observation of one of the researchers, noting the gross appearance of the lesions and consulting the surgeons' operative notes afterwards.

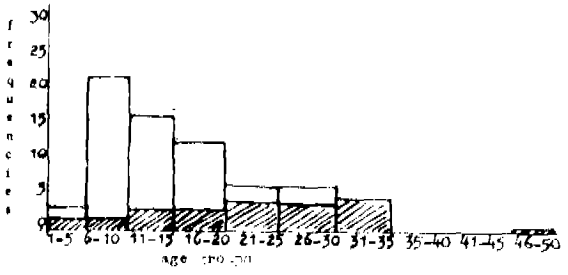
IV. Results and Discussion

Table 1. Sex Distribution

Males	Females	Total
50(59%)	35(41%)	85

Of the 85 patients, 50(59%) were males and 35(41%) were females, showing preponderance of males over females.

Graph 1. Age Distribution



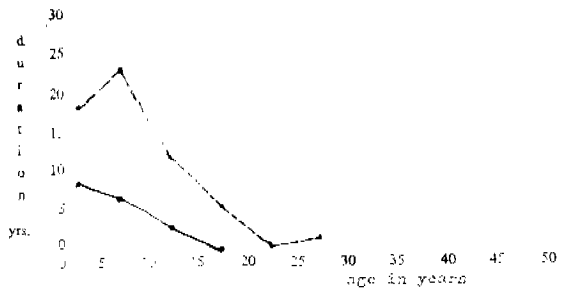
Most cases were in the ages 6-10 years and 11-15 years comprising 21(31.34%) and 15(22.38%) patients respectively, or a total of 53,72%, over half of the study population. This finding conforms with those of other investigators that chronic tympanomastoiditis is indeed a disease afflicting the young.

Table 2. Distribution of Lesions – Sidedness

X-ray Findings	A.U.	A.D.	A.S.	Subtotals
(–) cholesteatoma	9	5	4	18
(+) cholesteatoma	11	17	18	46
Bilateral CTM w/ unilateral cholesteatoma	0	15	6	21
Totals	20 (24%)	37 (44%)	28 (45%)	85

65(76%) had unilateral disease on either side, with both sides being almost equally affected. 20(24%) had bilateral disease. No one developed bilateral cholesteatoma radiographically

Graph 2. Frequency distribution of Duration of illness



C.T.M. _____

CTM w/ cholesteatoma _____

The duration of illness in years prior to their admissions of those with cholesteatoma peaked at 6-10 years. Among those with CTM the peak was at 5 years.

Table 3. P.E. findings vs. X-ray findings

CLINICAL	X-RAY CTM	CTMS w/ cholesteatoma
fetid mucopurulent discharge	18	67
hearing loss	18	67
otalgia	0	2
subperiosteal abscess/sinuses	8	32
stenosis, canal	3	1
aural polyp/granulation	8	29
epithelial debris	2	18
perforations: marginal	8	7
subtotal central	10	60
paralysis, 7th C.N.	0	3

Fetid, mucopurulent discharge, hearing loss and perforations were universal findings. Those with CTM without cholesteatoma had conductive losses ranging from mild to moderate degrees. Those from the cholesteatoma group had mixed losses with most of them incurring moderate to severe conductive and mixed hearing loss.

Only 7(10%) of those with cholesteatoma had marginal perforations. This is surprising in the light of teachings that it is the marginal (total, attic) perforation which is associated with the dangerous or surgical ear in cases of chronic suppurative otitis media.

No one among those with CTM and 3% of those who developed cholesteatoma radiologically complained of otalgia. These had subperiosteal abscesses.

Subperiosteal abscesses, sinuses and polyps occurred with almost equal frequencies in both groups.

Facial nerve involvement was observed only among those who had cholesteatoma and comprised only 4%.

Table 4. Results: Comparison of the X-ray findings with the surgical and clinical impressions.

X-ray interpretation	Clinical impression	Surgical Findings cholesteatoma	granulation	sclerosis only
C.T.M. 18(21%)	CTM 9(50%)	5(56%)	4(44%)	0
	w/ 9(50%) chol.	6(67%)	3(33%)	0
		11(61%)	7(39%)	
C.T.M. 67(79%) w/ chol.	CTM 12(18%)	8(67%)	4(33%)	0
	CTM w/ 55(82%) chol.	44(80%)	11(20%)	0
		52(78%)	15(22%)	

Clinically, 9(50%) of those with CTM on x-ray had cholesteatoma. Only 6(67%) of these 9 patients really had cholesteatoma upon surgery. Five patients (56%) out of 9 with clinical impressions of CTM alone turned out to have cholesteatoma. Eleven out of the 18, or 61%, actually had cholesteatoma, leaving 7(39%) without cholesteatoma.

Among those with radiologic evidence of cholesteatoma composed of 67 patients, 12 were diagnosed clinically without cholesteatoma and 55 with cholesteatoma clincially. Of these 12, 8(67%) had cholesteatoma and of the 55, 44(80%) had cholesteatoma upon surgery.

In both groups, we see a discrepancy between the radiological, clinical, and surgical findings.

Validity of a certain diagnostic procedure is measured by two parameters: the specificity and the sensitivity. Sensitivity is the ability to identify correctly those without the disease. These are expressed as percentages. Put simply, the higher the sensitivity the fewer the false negatives, and, the higher the specificity the fewer the false positives.

Computing for sensitivity:

$$\frac{\text{persons w/ disease detected}}{\text{total no. tested with disease}} \times 100$$

for specificity:

$$\frac{\text{persons w/o disease}}{\text{total no. of persons tested w/o disease}} \times 100$$

for those with cholesteatoma:

	diseased	not diseased	total
+	44	11	55
–	8	4	12
	52	15	67

sensitivity = 44/55 x 100 = 84.6%

specificity = 4/15 x 100 = 33.3%

In very simple temrs this means that given 10 cases wherein cholesteatoma is considered, 8 cases will be properly identified. However, the low specificity offsets the sentivity. Which means that erroneous diagnoses of cholesteatoma may be committed despite its true absence. There is still room for error in ruling in or out a diagnosis of cholesteatoma. What are the causes for these errors? How could the otologist obviate these mistakes?

While it is true that the mastoid lends itself to radiologic investigation, conventional techniques have the interest defect of offering pictures which are the summation of multiple structures located in various planes in one perspective, so that the small, structures being investigated are relatively obscured. Usually the normal antral size has been placed at 6 mm. transversely and 10 mm. vertically at full development. Antra larger than these dimensions are considered enlarged. The diagnosis of cholesteatoma radiologically does not rest only upon this but is further qualified by other criteria; erosive changes in the lateral wall, widening of the additus ad antrum, and smooth enlargement with a sclerotic border.

It is not a problem to diagnose the classic lesion such as this. It is in the small or borderline lesion where errors are most likely to be committed. This may not be such a great task for the experienced otologist who sees ear patients all the time and who operates daily, but, for the neophyte, the dilemma is indeed great. This lies in the 20% of cases which are likely to be missed out by x-ray. The limitations of conventional x-rays are voercome by tomography. Buckingham and Valvassori have outlined the role of tomography in the diagnosis of cholesteatoma. It is able to define size and extent, status of the ossicles, and anatomic variations such as low-lying dura, forward lateral sinus, elevated jugular bulb, carotid artery displacement, all of which are important to the surgeon.

Clinically, parameters which should lead one to suspect the presence of cholesteatoma despite the lack of radiologic evidence include:

Long-drawn course of illness with fetid mucopurulent discharge despite a seemingly innocuous central perforation. This is especially true among those who sustain hearing loss either with a large air-bone gap compatible with ossicular chain disruption or superimposition of a sensorineural hearing loss, It is the experience at the Department that most of these should no longer be considered safe in these instances. The squamous epithelium of the auditory canal has the ability to grow over these perforations and send out papillary projections leading to the genesis of the cholesteatoma within the middle ear cleft and mastoid process. This has been borne out by serila section studies of involved tympanic membranes by Abes and Marquet. Those patients with epithelial debris should be considered as harboring the disease. It can not be over emphasized that subperiosteal abscesses and sinuses, aural polyps, facial nerve involvement are sequelae and constitute indications for surgical intervention with or without radiologic evidence of cholesteatoma. Otalgia may be regarded as a sign of impending complications, observed among those with abscess formation and those who later develop intracranial problems.

SUMMARY AND CONCLUSION:

Mastoid x-rays are still helpful in screening for cholesteatoma. It will detect correctly those with the disease in every 8 out of 10 patients. However, false or erroneous results may also be obtained. It is important for the otologist or ENT man to recognize the signs of cholesteatoma otoscopically to corroborate the diagnosis. It is advisable to use multiple views. Even if the lesion is not obvious radiologically, the alert surgeon should be able to recognize indications for mastoidectomy thereby obviating life-threatening sequelae. In the remaining 20% where the clinical assessment and radiologic picture does not reveal anything sure the use of tomography may be of great help.

BIBLIOGRAPHY

1. Abes, G: Personal communications. Unpublished. Dept. of ENT UP-PGH.
2. Adams, GL, Boises, RL, Paparella, MM: *Fundamentals of Otolaryngology: a textbook of ear, nose and throat diseases.* 5th ed. Philadelphia, W.B. Saunders Company, 1978.
3. Laszle, I: Conventional radiography of the temporal bone. *OCNA* 6(2): 323-36, June 1973.
4. Livingston, PA: Differential diagnosis of radiolucent lesions of the temporal bone. *RCNA* 12(30: 571-83, Dec. 1974.
5. Mafee, MF, Valvassori, GE, Dobben, GD: The role of radiology in surgery of the ear and skull base. *OCNA* 15(4): 723-53. Nov. 1982.
6. Mawson, SR, Ludman, H: *Diseases of the Ear; a textbook of Otology*, 4th ed. Gr. Britain, Edward Arnold Books, 1979.
7. Meyerhoff, WL, Kim, CS, Paparella, MM: Pathology of chronic otitis media. *The annals of otology, rhinology, laryngology* 87(6): 749-759, Nov-Dec. 1978.

8. Mittermaier, R: *Otorhinolaryngologic radiology: a radiologic atlas of ear, nose and throat diseases.* New York, Grunne * Stratton, Inc., 1970.
9. Paparella, MM, Shumrick, DA: *Otolaryngology,* 2nd ed. Philadelphia, W.B. Saunders Company, 1980.
10. Samuel, E. Lloyd, G: *Clinical Radiology of the Ear, Nose and Throat,* 2nd ed. Philadelphia and Toronto: W.B. Saunders Company, 1978.
11. Shambaugh, GE, Glasscock, M: *Surgery of the Ear,* 3rd ed. Philadelphia and London, W.B. Saunders Company, 1980.
12. Smyth, G: Chronic *ear disease: monographs in clinical otolaryngology* vol. 2. Churchill-Livingstone, New York, Edinburgh, and London, 1980.
13. Zizman, J, Noyek, AM: Inflammatory diseases of the temporal bone. *RCNA* 12(3): 491-504, Dec. 1974.

Scientific – Symposium

on

"INTERESTING CASES IN OTOLARYNGOLOGY"

held on August 12, 1983 at the
Top of the Hilton, Manila Hilton

The Phil.
Jour of Oto.
Head & Neck
Surgery

VOICE IN DISTRESS*

Olivia G. Vasquez, M.D.**
Edgardo A. Cubacub, M.D.**
Jaime F. Flor, M.D.***

Hoarseness is the most common initial complaint of patients with cancer of the larynx. In a study done in UP-PGH from 1975-1980 by Flor, et al, approximately 71% of the patients with laryngeal cancer presented with hoarseness and about 40% of which were with accompanying dyspnea, attesting to the fact that these patients were seen late and required tracheostomy, total laryngectomy and irradiation.

Today, we are presenting a case of verrucous cancer of the larynx, seen in a relatively early stage and treated with hemilaryngectomy and epiglottic laryngoplasty.

We have here a case of a 63-year-old male who was admitted because of hoarseness. His condition started 9 month PTA as sudden onset of hoarseness without any accompanying signs and symptoms. He consulted a physician to no avail. Two months PTA, he consulted an otolaryngologist because of progressive hoarseness. He used to smoke 3-5 packs of cigarettes a day for 27 years. Indirect laryngoscopy showed an exophytic mass located in the anterior 2/3 of the right vocal cord. The cords were mobile and there was no bulging of the ventricle. Palpation of the neck did not reveal any node enlargement. Direct laryngoscopy revealed a plae looking exophytic mass in the anterior of the right vocal cord with involvement of the anterior commisure. Biopsy showed verrucous cancer. Partial vertical laryngectomy was contemplated although total laryngectomy with neoglottic reconstruction was considered depending on the operative finding.

SURGICAL TECHNIQUE. A tracheostomy was done to provide anesthesia. The thyroid cartilage was exposed through a midthyroid incision. An anterior cartilage cut was made 3 mm from the midline on the uninvolved side. The posterior cut was done 3 mm from the posterior border of the thyroid ala on the involved side. The cut was extended inferiorly and the subglottic space was exposed. The anterior 2/3 of the right vocal cord was involved with a 4 mm subglottic extension. Frozen section of the margin of resections were negative for malignancy. The large defect was reconstructed by epiglottic laryngoplasty. In epiglottic laryngoplasty the base of the epiglottis was mobilized downward and sutured to the cricothyroid membrane, thus, closing the defect.

COURSE IN THE WARD. Postoperatively, NGT was placed, osteorized feeding was started. On the 3rd post-operative day, he developed a pharyngocutaneous fistula. Basal crepilant rales were noted on the 4th post-operative day. He was discharged on the 8th post-operative day free of pneumonia. Feeding tube was maintained for 2 weeks because of the fistula. He was decannulized on the 3rd week.

Discussion

Carcinomas arising from the glottis are the most numerous of all laryngeal cancers and are predominantly a disease of the males. Over 2/3 of the patients are in the 4th to 7th decades of life. Initial complaints are usually intermittent hoarseness which becomes a constant hoarseness as the disease progresses. Continued growth of the neoplasm is accompanied by dyspnea, resulting from fixation of the vocal cord and reduction of the glottic space.

The majority of glottic cancers are squamous cell carcinoma, well-differentiated. Our case is verrucous cancer, a variant of squamous cell carcinoma. It accounts for approximately 1-2% of all laryngeal cancers. These tumors are clincially malignant but histologically benign. To date, none have so far metastasized.

Glottic carcinoma carries the best prognosis because of the paucity of the lymphatic system. High cure rates are observed with either radiation or surgical resection in early cases. Early cases are defined as tumors involving the midportion of the vocal cord without involvement of the anterior commissure. Survival rates can run as high as 90%. Ogura using these parameters, reported a 92% cure rate with irradiation. Brian and McCabe noted a 5-year survival rate of 78% for irradiation as compared to 83% for surgery. With these comparable results, the preservation of voice in early cases of glottic cancer makes irradiation the preferred treatment.

The factors which determines survival depend on the size, extent of the tumor, and the histological finding. The most crucial factor is the involvement of the anterior commissure. From here, the tumor can invade by submucosal extension into the opposite vocal cord, anteriorly to the thyroid cartilage, superiorly to the aryepiglottic folds, and posteriorly into the

*1st Prize
**Residents, De los Santos Medical Center.
***Consultant in Otolaryngology, De los Santos Medical Center.

interarytenoid region. With anterior commissure involvement, cobalt therapy results drop to 26-67% as found by Sheehan and Stone.

Histologically, our patient has verrucous carcinoma of the right vocal cord. Verrucous cancer has the following characteristics:

1. microscopically as well-differentiated keratinizing squamous epithelium arranged in papillomatous folds
2. they appear grossly as warty tumors
3. the clefts between the papillary folds are traced to the depths of the tumor
4. tumor infiltration on broad bases pushes the stroma with inflammatory reaction
5. cytological evidence of malignancy is absent.

Batsakis et al and Stell and Maran advocate surgery instead of radiotherapy in the treatment of verrucous cancer. This is because:

1. They are radioresistant. Ferlito et al reported 71.11% incidence of recurrence/persistence of the neoplasm with radiotherapy.
2. There is tendency to sarcomatoid and anaplastic transformation when the verrucous tumor is irradiated. Anaplastic transformation was noted between 2-7 months following radiotherapy.
3. Radiotherapy can produce perichondritis which can enhance the local invasion of the verrucous tumor.
4. More recent study shows failure of radiotherapy in the treatment of verrucous cancer which may be related to its lymphocytotoxic effects wherein lymphocytes and selective T-lymphocytes decrease.

Whether to do total laryngectomy or conservative surgery will depend on the extent of tumor as classified by TNM. The patient is in Stage 11, $T_2N_0M_0$ — meaning the tumor extended subglottically with normal cord mobility, without any node nor distant metastasis. Surgical treatment of choice was partial vertical laryngectomy based on the criteria set down by Ogura:

1. The cords should be mobile.
2. That the lesion should not extend more than 2 mm on the anterior end of the opposite cord.
3. Posteriorly past the midpoint of the arytenoid body.
4. Superiorly off the top of the vocal cord.
5. The gross subglottic extension should not exceed 5 mm.

Daly and Strong reported an 85% 5-year survival rate with partial vertical laryngectomy. Ogura gave a 75-85% cure rate with this operation.

After laryngectomy, the glottis was reconstructed

1. To prevent aspiration postoperatively.
2. To improve the quality of the voice.
3. To facilitate postoperative evaluation of the larynx.
4. To prevent glottic insufficiency.

In our case, we elected to do epiglottic laryngoplasty because it was a one-stage procedure that provided an excellent postoperative airway and minimal postoperative edema and cicatrix formation. The other methods conventionally used in reconstructing the glottis are the use of keels, stents, muscle flaps. These, however, required a 2-stage procedure and prolonged tracheostomy with a resulting less satisfactory airway.

The patient developed a pharyngocutaneous fistula on the 3rd postoperative day. He experienced severe coughing due to aspiration of secretions brought about by the defect in the laryngectomy site, the limitation of movement of the larynx, and incoordination of the swallowing mechanism. Moreover, there was inadvertent intake of vitamin preparation per orem instead of per NGT. This was managed by NGT feeding, local wound care, pressure dressing, and antibiotics. Other causes of fistula formation are infection, faulty suturing technique, and inadequate closure and reconstruction. In our patient, we did a 5-layer suturing from the epiglottis to the skin.

Follow-up one month postoperatively shows there was no aspiration, the fistula spontaneous resolved, the voice is adequate but raspy, airy in character. At this point, we would like to pause for an important announcement from our patient.

We have presented a case of verrucous cancer of the glottis documented by laryngoscopy and biopsy. It is important to emphasize that these cancers have a good survival rate when detected and treated early. Hoarseness should not be taken lightly and the throat should be examined by laryngscopy. The method of management for Stage 11 verrucous cancer is partial vertical laryngectomy. A new method of reconstruction using epiglottic laryngoplasty was presented and the complications were discussed.

BIBLIOGRAPHY

1. Adams, et al, Fundamentals of Otolaryngology, 5th ed., 1978, pp. 547-652.
2. Batsakis, John, Tumors of the Head & Neck, 1980 ed., pp. 204-223.
3. Biller, H., et al, Vertical Partial Laryngectomy for Glottic Carcinoma with Posterior Subglottic Extensions, Annals of Otolaryngology, Vol. 86, 1977, pp. 715-717.
4. Lee Santo, et al, Ca of the Larynx Glottic Ca. The Surgical Clinics of North America, Vol. 5, No. 3, June 1977, pp. 611-620.
5. Doyle, et al, Glottic Squamous Cell Carcinoma (T2), A Retrospective Study, Annals of Oto-

laryngology, Vol. 86, 1977, pp. 719-723.
6. Freund, R.. Principles of Head and Neck Surgery, 2nd ed., pp. 220-276.
7. Flor, et al. Preliminary Report on Ca of the Larynx, 35 Cases from 1975-1980.
8. Lore, J.. An Atlas of Head & Neck Surgery, 2nd ed., Vol. 21 1973, pp. 709-794.
9. Paparella, M. et al. Otolaryngology Head & Neck Surgery, (Vol. 3), 1975, pp. 666-681.
10. Snow, J.B.. Controversy in Otolaryngology, 1980, pp. 447-464.
11. Thorek, Philip. Surgical Anatomy, 2nd et., pp. 217-230.
12. Lee K. J., et al. Essential Otolaryngology, 1978, ed., pp. 311-317.

The Phil.
Jour of Oto.
Head & Neck
Surgery

DELTOPECTORAL SKIN FLAP FOR CERVICAL ESOPHAGUS RECONSTRUCTION*

Dr. Felix P. Nolasco**
Dr. Jan Eero G. Lopez**
Dr. Rodolfo P. Nonato**
Dr. Joselito C. Jamir***

INTRODUCTION:

The reconstruction of the cervical esophagus has always been considered a formidable task and seems to be a perplexing problem as far as local experience is concerned. The numerous methods devised constitute a tribute to surgical ingenuity. Von Mikulicz, in 1884, was the first to reconstruct the pharynx and cervical esophagus. Since that time numerous methods have been proposed ranging from repair with local skin from the neck by Wookey (1942); skin graft with polyethylene tube by Negus, etc. (1950) to bringing up portions of the stomach or colon in the upper neck as reported by Hemlick, Shernan and other authors. However, in the last decade a single operative procedure has emerged as the most commonly used in reconstructive procedures following Head & Neck Surgery. The construction of a medially based deltopectoral flap devised by Bakamjan (1965) is an exceedingly practical way to replace a sizeable defect between the base of the tongue and the distal esophagus. In fact, it has become the work-horse of head and neck surgeons as it could provide skin or mucosal lining whether it be in the lip, cheek, floor of the mouth or pharynx.

The authors would like to share with your their experience of using deltopectoral flap in the reconstruction of the cervical esophagus. This case is the first one done in the dept. of E.N.T., UP-PGH and probably the first in our country.

CASE HISTORY:

L. V., 63 year old female, consulted for hoarseness associated with difficulty of swallowing. Her illness apparently started 5 years prior to admission when she first developed horseness with slight difficulty of swallowing large chunks of food. She was told by a physician to have a mass on the left side of her larynx, however, she claimed that she improved with medications. Three years later, the horseness and dysphagia became worse such that food had to be ground and swallowed with water. Apparently, she felt comfortable with some medications. Four months prior to admission she consulted an E.N.T. specialist who referred her to the Philippine General Hospital for further evaluation and management.

Indirect laryngoscopy showed a fungating mass in the area of the left supraglottis. Esophagogram was interpreted as intrinsically normal and no neck nodes were palpated. The patient was then admitted and direct laryngoscopy showed a fungating mass on the pyriform sinus area involving the left arytenoid and epiglottis. Biopsy revealed squamous cell carcinoma, keratinizing.

Technique of Operation:

Using an apron incision under general anesthesia, the patient underwent total laryngectomy, total thyroidectomy and cervical esophagectomy.

Intraoperatively, the tumor was noted to involve the left epiglottis, arytenoid, aryepiglottic fold, paraepiglottic space, pyriform sinus to the cricopharynx and downward to involve the cervical esophagus up to about 5 cms. from the pyriform sinus. The involvement of the esophagus was circumferential with areas of induration all around the lumen but without obstruction. The lesion was submucosal. The left lateral esophageal wall was breached by tumor infiltrating into the substance of the left lobe of the thyroid gland and isthmus.

The esophagus was cut with a margin of 2 cms. normal tissue just above the level of the suprasternal notch. Frozen sections of margins were negative for tumor cells.

After generous washing of the operative site, the use of the deltopectoral flap for the reconstruction of the cervical esophagus was done in the following steps:

(1) The left deltopectoral flap was measured, marked out and raised to include the deep pectoral fascia and axial branches of the first four internal mammary perforating vessels.

(2) the flap was swing into position through the lower neck incision lateral to the tracheal stoma and under the central bipedical flap.

(3) The flap of its distal end was then sutured end to end to the upper proximal end of the divided

*2nd Prize
**Formerly Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
***Asst. Professor, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.

pharynx with a continuous inverting 2-0 chromic catgut stitched on with tapered needles. The layer was then backed up with well-spaced interrupted 3-0 Dexon sutures.

(4) The transported flap then was tubed on itself, raw surface outwards and buried beneath the central neck flap.

(5) A nasogastric tube was then passed and the tubing of the flap was continued downwards using the same suture technique until the esophageal stump was reached.

(6) On the lower portion of the tubed flap, the oval opening of the esophagus was then carefully sutured end to side at a convenient point into the deltopectoral flap.

(7) The cut end of the trachea was then sutured with silk and chromic catgut 2-0 to form a stoma.

(8) It would then be noted that a small fistula now leads out onto the chest wall to the side of the tracheostoma which was left open and the lumen of the tube was decompressed with a suction catheter in retrograde fashion up the tube as far as the pharyngeal junction. Suction drains were then placed through the flap on each side of the neck and the wound was sutured in layers.

After one month, the second and final operative stage was done. The proximal end of the deltopectoral tube was divided and the flap was returned to the chest with free skin grafting done on the remaining raw donor area. The lower end of the skin tube was closed by simple inverting 3-0 Dexon suture and buried beneath the lower neck incision.

DISCUSSION:

The design of the deltopectoral skin flap is medially based in which the borders are superior, the infraclavicular line; inferiorly, the 5th rib (2 finger-breadths above the male nipple extending along the apex of the anterior axillary fold); medially, the first 4 intercostal spaces at approximately 2 cms. from the sternal edge; laterally, the entire deltoid region which may be expanded to fit the surgical defect.

The supplying vessels are: (1) the deltoid skin is perfused by numerous musculocutaneous arteries from the underlying musculature (7-16 arteries); (2) the cutaneous branches of the thoracoacromial artery which emerges from deltopectoral sulcus; (3) medial to the cephalic vein, several musculocutaneous arteries penetrate the flap from the pectoralis major, cutaneous branches of the transverse cervical and suprascapular arteries; (4) the anterior thoracic perforators of the internal mammary artery emerge in the intercostal spaces approximately 1 cm. from the sternum and run laterally for 10-12 cms. The second perforator is the largest followed by the 3rd and the 4th. After entering the flap, these anterior thoracic perforators turn and course parallel to the skin toward the deltopectoral groove. These direct cutaneous arteries appear to be interrelated through a medial vascualr arcade formed by the mammary branch of the 2nd perforator.

Venous drainage is a dual system composed of superficial veins in the subdermal plexus and the deeper paired venae comitantae which accompany all cutaneous arteries.

Hymodynamically, the flap may be divided into (1) a cutaneous (random) flap, lateral to the cephalic vein and, (2) an arterial pedicle (axial) flap, medial to the cephalic vein.

For the deltopectoral flap to survive, however, the deltoid, thoracoacromial, and pectoral vascular regions must be 'fused' and rendered solely dependent upon the anterior thoracic perforators.

Furthermore, the advantages of the deltopectoral skin flap are many:

1. Its use does not result in further facial cosmetic deformity.

2. This flap consists of tissue that has not been previously insulted by radiotherapy or by surgery and does not lie in the field for future radiotherapy.

3. The deltopectoral flap represents tissue that has an outstanding blood supply that is rarely compromised, even by small vessel obliterative disease.

4. It is the most dependable of all major reconstructive flaps and rarely requires delay. When the flap fails, it is frequently on the basis of poor recipient site, rather than inadequate donor tissue.

5. This flap is mobile and can be moved in all planes without apparent compromise of tissue perfusion

6. It has a broad reach, being able to line the region of the nasopharynx as well as other more accesible intra-oral and oropharyngeal regions.

7. Its dependent base favors venous out flow

8. It has a relatively hairless and non-bulky character.

It has been shown that the complications in the use of the deltopectoral flap in cervical esophagus reconstruction and other head and neck procedures are predominantly due to operative placement and the post-operative management of the flap which are as follows:

1. Construction of the pedicle either from the tracheostomy tie or from the passage of the pedicle through a tight orifice to use it as a lining.
2. Traction of the flap which leads to tension necrosis or separation of the flap.
3. Transversely folding tip of the flap to provide both lining and cover leads to ischemic necrosis.
4. Major infection within a large dead space.

5. Hematoma.

6. Residual tumor on the site of flap application.

7. Fistula at the site of flap inset is potentially dangerous.

8. Poor recipient site.

In our patient we did not encounter any complication except for infection on the bare donor area on the left chest. Closure of the lower pedicle stoma, which is done on the 2nd last stage of operation, can be performed as early as within 3 weeks. At this time, the dissection along the lower and of the tube can be carried out easily by blunt dissection. The proximal portion of the tube is amputated and returned to the donor site. Caution should be taken to leave an adequate length of the tubed flap in the region of the esophageal anastomosis to effect easy closure without compromising the lumen of the esophagus.

Two weeks after the amputation of the flap, barium swallow was done and it showed a good passage of the contrast material through the tubed deltopectoral flap. the nasogastric tube was then removed and the patient started to drink and eat like she was before once again.

SUMMARY:

The reconstruction of the cervical esophagus following cervical esophagectomy for extensive hypopharyngeal carcinoma has been considered a formidable task by many head and neck surgeons and because of the difficulty, some may even shy away from the operation. This paper shows one such case which was reconstructed using a deltopectoral flap. The anatomy, hemodynamics, advantages and pitfalls in the use of the deltopectoral flap was discussed. It was demonstrated that the procedure is really safe, easy and practical for the otolaryngologist.

BIBLIOGRAPHY

1. Sherlock, E. and Madox, 2.: The Versatile Deltopectoral Skin Flap in Reconstruction About the Head and Neck. *The American Journal of Surgery*, Vol. 118, pp. 744-751, No. 1969.

2. Krizek, T., and Robson, M.: Potential Pitfalls in the Use of the Deltopectoral Flap. *Plastic and Reconstructive Surgery, 30: 4, pp. 326-331, Oct. 1972.*

3. Park, J., etc.: Reconstructive Experience with the Medically Based Deltopectoral Flap. *The American Journal of Surgery*, 128: pp. 548-551, Oct. 1974.

4. Bakamjam, V: The Concept of Cure and Palliation by Surgery in Advanced Cancer of the Head and Neck. *The American Journal of Surgery*, 126: pp. 482-487, Oct. 1972.

5. Mendelson, B. etc.: Experience with the Deltopectoral Flap. *Plastic and Reconstructive Surgery*, pp. 360-365, March 1977.

6. Harrison, D.,: Rehabilitation Problems Afrer Pharyngogastric Anastomosis. *Arch. Otolaryngology*, 104:224-246, May 1978.

7. Harrison, D.: Surgical Management of Hypopharyngeal Cancer. *Arch. Otolaryngology*, 105: 149-159.

8. Daniel, D. etc.: The Deltopectoral Flap: An Anatomical and Hemodynamic Approach. *Plastic and Reconstructive Surgery*, 55:275-281, 1975.

9. Carpenter, R., etc.: Reconstruction After Total Laryngectomy. *Arch. Otolaryngology*, 105: 417-422, July, 1979.

10. Ballantyne, A. J.: Methods of Repair After Surgery for Cancer of the Pharngeal Wall, Pastericoid Area, and Cervical Esophagus. *The American Journal of Surgery*, 12:482-485., Oct. 1971.

11. Freund, R.: *Principles of Head and Neck Surgery. Appleton Century Craft, 1978, pp. 238-241.*

12. Snow, J.: *Controversy in Otolaryngology, W.B. Saunders Co., 1980, p. 512.*

13. Batsakis, J.: *Tumors of Head and Neck.* Williams & Wilkins; 1978, p. 169.

14. Wilson, J.: *Operative Surgery.* Butterworths. 1981, pp. 759-764.

The Phil. Jour of Oto. Head & Neck Surgery

AIR FILLED SAC IN THE NECK

Rodante P. Saballa, M.D.*

INTRODUCTION:

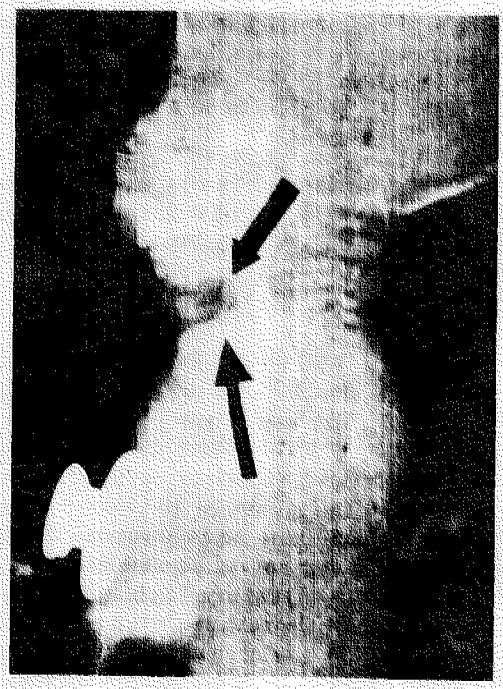
Laryngocele, also known as aerocele or pneumatocele, is an air filled cystic dilatation of the saccular appendage of the laryngeal ventricle. It is a rare clinical entity that even in the premier hospital in the country (UP-PGH), no record is available of one being confirmed laryngographically.[1] Local literature is devoid of any article on the subject. The same is true with the available copies of the Archives of Otolaryngology at the MCU Medical library. In two (20 issues of the Annals of Otology, Rhinology and Laryngology, (Ann. Otol. 89:1980 and Ann. Otol. 29:1960) 3 cases of laryngoceles were reported and all of them were of the internal type. According to Melvin Buttler and Willard F. Goff, M.D., less than 100 cases have been published so far.[4] On the other hand, Fedrickson and Ward in review of the literature on the subject, found a total of 174 cases of sufficient interest. No mention of the external type of laryngocele has been noted in any of the references used, although this was beautifully described by our Boie's Textbook of Otolaryngology.

The Department of Otolaryngology, MCU Hospital will present even a rarer form of laryngocele – the external type, one that extends through the thyrohyoid membrane with cystic dilatation in the superficial layers of the lateral neck.

REPORT OF A CASE

A 2-day old infant was admitted at MCU Hospital gasping for breath. Blue in the face and extremities, it all started 24 hours after birth when initial feeding was commenced. Aside from being dyspneic and cyanotic, this infant also ran a temperature of 37.8 degrees centigrade. There was a soft fluctuant cystic mass, about 2 cm. in diameter on the left lateral aspect of her neck which was not so obvious on inspection unless the neck was hyperextended to the right. X-ray revealed a well-circumscribed radiolucency on the left side of the neck. There was no unusual pre-natal, consanguinity or hereditary factors that will in anyway explain the defect. Infant was full term with no visible sign of birth trauma noted.

In the ward, there were bouts of cyanosis everytime the youngster cries. More importantly, whenever this happens there was an obvious enlargement of the mass which regressed everytime the patient stopped crying.



This child was initially referred to a pediatric surgeon who gave a diagnosis of aspiration pneumonia on the basis of "streaky densities in both lower lung fields." This neck mass was diagnosed as hygroma. When the child was referred to our department, the only impression given was one of a probable external laryngocele. The pediatric cardiologist who was next consulted said "the baby has congestive heart failure" and went ahead to suggest remedial measures. All the time however, the EKG tracings were within normal limits. Several blood gas studies were ordered but the results were unequivocal.

DISCUSSION:

Until this instant case was presented in a clinical conference, this was just one of those cases so to speak. The discussion that followed, however, proved interesting as it illustrated how the unwary could stick

*Senior Postgraduate Trainee, Dept. of Otolaryngology, MCU-FDTMF.

stubbornly to a diagnosis however illogical it may be.

This case is therefore presented not so much on account of its rarity but to show how such a condition can confuse even the astute clinicians, the importance of interdepartmental consultations as well as to suggest simple treatment procedures which can be undertaken in emergency situations.

The diagnosis of the pediatric surgeon was cystic hygroma. Certainly, a hygroma does not change in size with crying. The most important single finding in this particular case, being the presence of air within its cavity, hygroma, a form of lymphangioma, becomes too far-fetched as it does not contain air within its confines. That it was ill-defined and fluctuant while contributory are not as important.

On the other hand, a laryngocele of the external type, that it will explain all the observations seen in this case. Essentially, an air sac, it naturally will contain air fed it from the airway itself on straning like crying and emptying itself whenever the child is quiescent. The value of the chest (larynx) closes on straning thus building up the air pressure in the airway up to the level of the false cords consequently transmitting it into pockets, if any, like the saccular appendix, causing it to enlarge. And if allowed to continue, the evagination increases in size and may eventually penetrate through the thyrohyoid membrane and form an external laryngocele, as in this case. Being adjacent to the larynx, which in infant is a soft structure, the same can be compressed and subsequently impede or obstruct the airway. Allowing to empty itself during periods of quiescence, it is only logical to assume that it can and will diminish in size thus reduce the pressure on the airway and relieve the obstruction.

The failure to confirm finding radiographically is due mainly to faulty technique. Laryngography, being of limited application is seldom done. Experience, in most instance therefore, is wanting especially when working in an infant's larynx where teamwork between the anesthesiologist and otolaryngologist is essential. Moreover, the opening of the appendix is located in the anterior end of the ventricle so that in the recumbent position, chances of introd introducing the dye into its opening is next to impossible.

COMMENTS:

The case presented belongs to the external type as it has penetrated through the thyrohyoid membrane. Diagnosis may be verified by laminogram or plain x-ray of the neck demonstrating air within the sac. Small asymptomatic type need no therapy but symptomatic and infected ones require removal by excision via a lateral pharyngotomy approach where the sac is identified and dissected to its origin. Unfortunately, due mainly to lack of logistics, the patient was brought home by her parents before any definite therapy could be instituted or accomplished.

However, as initially suggested, if the condition comes to worse needle aspiration of the contained air could be resorted to as an emergency measure. If this fails, which is highly improbable intubation can be done.

SUMMARY:

A rare case of an external laryngocele is presented to alert the practitioner to this condition so that it may be considered in the diagnosis of cystic masses on the lateral aspect of the neck.

BIBLIOGRAPHY

1. Enriquez, Angel, M.D., Personal Communication

2. Holinger, P.H. and Bown, W.T., Congenital Webs, Cysts, Laryngoceles and other Anomalies of the Larynx, The Annals of Otology, Rhinology and Laryngology, Vol. LXXVI, No. 4, Oct. 1967, pp. 744-752.

3. Yarington, C.T. and Frazer, J.P., An Approach to Internal Laryngoceles and Other Submucosal Lesions of the Larynx, The Annals of Otology, Rhinology and Laryngology, Vl. LXXV, No. 4, pp. 956-959, Dec. 1966.

4. Buttler, Melvin and Goff, Willard, Internal Laryngocele Treated with Endoscopic Excision and Fulguration, The Annlas of Otology, Rhinology and Laryngology, Vol. LXIX, No. 1, March 1960, pp. 29-34.

5. Bryce, D.P. and Cranston, J.R. Prolapse of the Laryngeal Ventricle, The Annals of Otology, Rhinology and Laryngology, Vol. LXXV, No. 2, June 1966, pp. 398-407.

6. Cannalis, R.F., Laryngeal Ventricle, The Annals of Otology, Rhinology and Laryngology, Vol. 89, No. 2, Part 1, March-April, 1980, pp. 184-187.

7. Strife, Cotton, Donegan, Seid and Donbar, Internal Laryngocele and Saccular Cysts in Children, The Annals of Otology, Rhinology and Laryngology, Vol. 89, No. 5, Part 1, Sept.-Oct. 1980, pp. 409-412.

8. Moghtader and Arena, Laryngocele, The Annals of Otology, Rhinology and Laryngology, Vol. LXXIV, No. 4, Dec. 1965, pp. 1079-1084.

9. Paparella, Michael and Shumrick, Donald, Otolaryngology, Vol. 3, Head and Neck, second edition, 1980, pp. 2504-2505.

10. Adams, Boies and Paparella, Fundamentals of Otolaryngology, fifth edition, 1979, pp. 562, 517.

The Phil.
Jour of Oto.
Head & Neck
Surgery

LINGUAL EPIDERMOID CYST

Rodolfo P. Nonato, M.D.*
Rene S. Tuazon, M.D.*
Gil M. Vicente, M.D.**

Lingual dermoid cysts, though rare, have been recognized as early as 1778. Although relatively simple to manage, neglected cases are occasionally seen that not only challenge the mettle of the specialist but so vividly manifests the cruelty of ignorance to an innocent child.

CASE REPORT

E.S., a 6-year old female from Samar was admitted to the Philippine General Hospital on July 12, 1983 for a protruding tongue mass.

Past Medical History – The past medical history was essentially non-contributory. The patient was born full-term, the first of three siblings. There was no similar illness in the family.

Current Illness – Illness dates back to a *few days* after birth when the parents noted that the patient had a diffusely enlarged tongue. No feeding nor breathing difficulties were noted despite gradual enlargement of the tongue. At 2 years of age, a local physician was consulted and surgery was advised. However, the parents were told to wait till the child was 7 years old so that she could tolerate the surgery better.

No further medical consultation was made. The tongue mass continued to enlarge and began to protrude associated with slight difficulty in vocalization and drooling of saliva.

Physical Examination – On admission, examination revealed a pinkish, smooth, doughy, non-tender 9 x 8 x 6 cm lesion on the midline anterior aspect of the tongue with areas of exfoliation. The mass was protruding out of the oral vestibule, its ventral surface riding on the lower lip. The central lower teeth were loose and deviated outward.

Surprisingly, the patient had intelligible speech and only slight difficulty in introducing food into the mouth.

Aspiration of the mass resulted in a light brown, turbid aspirate with yellowish precipitate. Cell block of the aspirate showed numerous neutrophils, few lymphocytes and pinkish amorphous material.

X-rays of the mandible revealed a soft tissue density which appears to originate at the floor of the mouth with associated expansion of the lower teeth.

Operation – The anesthesiologist had no difficulty in inserting an endotracheal tube. The tongue mass was retracted anterior by an assistant and a circumferential incision was made. The incision was so placed that as much of the mobile part of the tongue could be spared. The mass was well encapsulated and the surrounding tissue (i.e. genioglossus) was easily separated with a wad of gauze and finger dissection. Closure was accomplished with two layers of absorbable suture. A retraction suture was placed on the tongue.

Surgical Pathology Report – The gross specimen consisted of a pinkish, globular, doughy tissue measuring 9x8x6 cm. The anterior aspect was covered with mucosa while the posterior aspect was occupied by a well-encapsulated cyst. The cyst contained yellowish pasty material as well as brownish fluid.

Microscopically, sections showed a cyst lined with compressed squamous epithelium and filled with fragmented keratin. No skin appendages nor connective tissue derivatives were noted.

The final pathologic diagnosis was "Epidermoid Cyst".

Post-Operative Course – A nasogastric feeding tube was inserted and removed on the third day. The patient was started on a soft diet and was discharged on the sixth post-operative day, but on regular follow-up.

A dental consult was made regarding the lower dentition problem. It was the dentist's opinion that the deformed permanent lower teeth could no longer be saved. It was agreed that the plan of using a head-chin appliance to correct the mandibular deformity would be beneficial.

DISCUSSION

Dermoid cysts are diagnosed more commonly in the testes and ovaries, but may be found anywhere in the body at an embryologic fusion point. New and Erich, in a series of 1,493 dermoid cysts, found 103 cases (6.9%) in the head and neck. Of these head and neck cases, 23.3% were found in the floor of the mouth or an overall incidence of only 1.6%.

When found in the oral cavity, dermoid cysts are usually in the anterior portion of the floor of the mouth. Very rare forms have been found on the dorsum of the tongue and palate.

*Formerly Chief Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center.
**Formerly Senior Resident, Dept. of Otorhinolaryngology, UPCM-PGH Health Sciences Center

Many attempts have been made to classify lingual dermoids with regards to gross description – by position, by attachments, by relation to adjacent musculature. Batsakis recognizes Colp's classification that dermoid cysts of the floor of the mouth present in either sublingual or submental position. It was Meyer, however, who proposed an overall classification for these cysts.

Epidermoid cyst. Epithelial-lined cavities surrounded by a capsule without skin appendages.

Dermoid cyst. A cyst with similar lining epithelium but with skin appendages such as sebaceous and/or sweat glands, hair and hair follicles.

Teratoma. An epithelial-lined cavity mixed with tissues (bone, muscle, glands) from all three germinal layers.

The most accepted theory on the pathogenesis of lingual dermoid cysts is that epithelial debris or rests are entrapped during the midline closure of the bilateral first and second branchial arches to form the body of the tongue and floor of the mouth. Entrapped cells during this fusion (fourth to sixth week of life) are totipotential blastomeres hence, any or all threegerm layer derivatives may be found in dermoid cysts. Studies in chick and cat embryos support this theory. Other hypotheses being offered are ectodermal differentiation of multipotential cells which were pinched off at the time of closure of the anterior neuropore and traumatic implantation during uterine development.

Clinically, dermoid cysts are uncommonly seen at birth or infancy. Gold et al remarked that congenital epidermoid cysts of the anterior half of the tongue are "extremely rare". The majority of dermoid cysts of the floor of the mouth occur in young adults, before the age of 35. This is in contradistinction to dermoid cysts in other regions. There is no sex predilection.

Lingual dermoids are usually several centimeters in size when initially seen, they are doughy to rubbery, and are usually filled with a yellowish cheesy material derived from the cyst wall. Pitting may be evident.

The usual presenting symptom is a slowly enlarging intraoral swelling in the floor of the mouth. Usually found above the mylohyoid, the cyst may penetrate the muscle and manifest as an extraoral swelling – a gradual development of a "double chin" appearance. Difficulty in speech and swallowing also occur.

Dermoids occasionally become infected and develop sinus tracts which open intra- or extraorally. It is this complication that some authors have in mind when diagnostic aspiration is resorted to.

Differential diagnosis of any swelling in the floor of the mouth include: ranula, cystic hygroma, hemangioma, acute infection of the floor of the mouth, benign or malignant salivary gland tumor, cysts of Wharton's duct, lipoma and several other entities.

Treatment is complete surgical removal. The cyst is easily enucleated by blunt dissection. The surgical approach varies intraorally or extraorally. The intraoral approach is preferred for cysts lying between the geniohyoid muscle and the oral mucous membrane. The extraoral approach is suggested for cysts lying between the geniohyoid and mylohyoid muscles.

SUMMARY

A review of lingual dermoid cysts has been presented together with a report of a probable congenital epidermoid cyst. Review of literature has shown that a true dermoid cyst in the floor of the mouth of infants is a rare occurrence.

The neglected case just reported is a most salient argument on the importance of adequate intraoral examination at birth and the proper timing of surgical intervention.

BIBLIOGRAPHY

Howell, W.E. and Stein, H. Sublingual dermoid cyst in infant: report of a case. J Oral Surg 30: 437 June 1972.

Smolansky, S.J. and Cardinal, J.P. Lingual dermoid cysts. ENT J 58:11 June 1979.

Gold, B.D. and Sheinkopf, D.E. Dermoid, epidermoid, and teratomatous cysts of the tongue and the floor of the mouth. J Oral Surg 32:107 Feb 1974.

Batsakis, John G. Tumors of the Head and Neck, 2nd ed. The Williams and Wilkins Co., Baltimore, 1979.

Stell, P.M. and Maran, A.G.D. Head and Neck Surgery, 2nd ed. William Heinemann Medical Books Ltd., London, 1978.

The Phil.
Jour of Oto.
Head & Neck
Surgery

SARCOMATOUS DEGENERATION IN A NASOPHARYNGEAL ANGIOFIBROMA

Jan Eero G. Lopez, M.D.*
Romeo L. Villarta, Jr., M.D.*
Rene S. Tuazon, M.D.*

Edilberto Jose, M.D.**

Benjamin Canlas, M.D.***
Adelaida D. Cruz, M.D.***
Ernesto de Veyra, M.D.***

Introduction:

Juvenile nasopharyngeal angiofibroma is an uncommon neoplasm that occurs almost exclusively among adolescent males. It's biologic behaviour is associated with potentially life-threatening hemorrhage, local invasion and extension into contiguous structures, and at times with recurrences. Spontaneous regression is viewed with skepticism by most authorities. Although surgical extirpation is generally regarded as the treatment of choice, radiation had been recommended by several authors in the past as the primary modality or as an adjunctive mode of treatment. There had been several case reports in foreign literature of a sarcomatous form of angiofibroma. We would like to report a case, probably the first in local literature of sarcomatous degeneration in a nasopharyngeal angiofibroma.

Case Report:

The patient was a 34 years old Filipino male who was admitted into the Dept. of E.N.T. of the U.P.-P.G.H.M.C. for six times because of recurrent and recalcitrant angiofibroma. He was first admitted last 1959 at the age of 12 for a two year history of episodic epistaxis associated with left sided nasal obstruction. The pre-operative impression was juvenile nasopharyngeal angiofibroma. On January 1959 he underwent transpalatal excision of a left nasopharyngeal mass. Sections of the tumor on microscopy were described as cords of fibrous tissue composed of spindle shaped cells and nuclei with plenty of collagen fibers. A portion of the section showed clumps of chronic inflammatory cells. There were also larger empty cavernous vascular channels. This was reported as nasopharyngeal angiofibroma. The patient was subsequently admitted for a second time because of symptoms of nasal obstruction. In July 1959 a nasopharyngeal mass was excised and histopathologic examination of the tumor was essentially the same as that of the fist specimen. Post-operatively, the patient received radiation therapy (3,500 rads) for residual tumor.

The patient remained asymptomatic for 19 years. In 1978, at the age of 31 there was recurrence of epistaxis. Transpalatal excision of the mass was done on January 1978. Tumor was removed from the nasopharynx, left maxillary antrum and pterygoid area. Microscopically, the cut sections displayed empty cavernous, endothelially lined channels which were unremarkable in a stroma of fibrous tissue. This was again reported as angiofibroma. The patient was subjected to post operative radiation of 3,500 rads.

A year after, 1979. the patient was readmitted for the fourth time for epistaxis and left malar swelling. He underwent partial maxillectomy on June 1979. The microscopic findings were the same as the other biopsy specimens in 1959 and 1978.

In 1980, there was recurrence of the left malar prominence with proptosis of the left orbit. He was readmitted for the fifth time and underwent total maxillectomy with orbital exenteration on August 1980. Intra-operatively, the surgeon noted extension of the tumor into the left orbit and apex, left pterygoid area, and base of the skull. Microscopically the excised tumor displayed marked cellularity. The angiomatous portion showed no atypicality. However, the fibrous stroma consisted of pleomorphic, atypical, immature fibrocytes with large nuclei, displaying hyperchromasia and occasional mitoses. The histologic diagnosis was angiofibroma with hypercellularity.

Several months later, in 1981, the patient was readmitted for the 6th time for bleeding from the left orbit and extension of the growth into the left middle cranial fossa. He underwent craniotomy for palliative extirpation of the tumor. The patient, however, succumbed two weeks post-operatively to massive septicemia. The specimen grossly and microscopically resembled an angiofibroma in it's basic architectural pattern. Microscopically, there was a fibrous stroma with vascular channels. On closer scrutiny, the angiomatous portion was unremarkable. The fibrous component was definitely highly cellular. The constituent cells were fairly immature displaying marked pleomorphism. Large vesicular nuclei could be readily

*Formely Senior Residents, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center
**Assistant Professor, Dept. of Otolaryngology, UPCM-PGH Health Sciences Center
***From the Dept. of Pathology, UPCM-PGH Health Sciences Center

appreciated. In some parts multinucleated giant cells with mitoses could be noted. These portions resembled fibrosarcoma. The histologic diagnosis, verified by three senior consultant pathologists of the U.P. College of Medicine was angiofibroma with sarcomatous degeneration.

DISCUSSION:

Angiofibroma is a relatively rare, histologically benign but clinically malignant tumor with a predilection for the nasopharynxes of adolescent males.[3] Most authorities deny the existence of a sarcomatous form of angiofibroma. However, there had been several reports to the contrary. Batsakis et al reported in 1955 a case of fibrosarcoma arising from an angiofibroma 10 months after extensive radiotherapy (9,000 Rads).[2] Hormia and Koshinken in 1969 reported a case of angiofibroma which had metastases to the regional lymph nodes and bone marrow.[6] Gisselson et al described a case in which sarcomatous degeneration occurred in an angiofibroma after a benign course of 21 years.[5] Other reports include those of Figi and Davis, and Handousa et al.[4] This case resembles in some respects the case report of Batsakis et al.

Shortly after Roentgen's discovery in 1895, X-rays were used by physicians for the treatment of various malignant and benign diseases. Leukemia after radiation exposure has been well documented since it was first noted in 1911. Shortly afterwards, malignant tumors were reported among physicists exposed to ionizing radiation as well as among radiologists and uranium ore workers. Duffy and Fitzgerald in 1950 first called attention to the late effects of early radiation for benign disease by the reported "minienidemic" of thyroid cancer. Over the years, hundreds of epidemiologic and single case reports have appeared describing cases of radiation-induced neoplasia.[7, 8, 9] It is agreed that radiation levels as low as 3,000 rads can provoke malignant changes or growths.[10]

Cahan defined the criteria by which radiation induction of malignant sarcoma of bone may be determined. These criteria have also been applied to identify radiation induced malignancies elsewhere in the body:[1]

1. microscopic or X-ray evidence of non-malignancy in the initial lesion;
2. presence of a newly formed sarcoma in the irradiated field;
3. relatively long asymptomatic latent period (Modified by Allen to encompass 3-5 years); and
4. histologic proof of the new lesion.

In this case, the initial histologic picture was that of angiofibroma. After a latency period of 23 years after the initial radiation (3,500 Rads), and two years after the second radiation (3,500 Rads), the tumor was documented to exhibit malignant features. The specimen in the 5th operation showed marked cellularity with pleomorphic, atypical cells with large hyperchromatic nuclei with mitoses. The specimen in the 6th operation showed a highly cellular fibrous component displaying pleomorphism and atypicality with large, vesicular and hyperchromatic nuclei with mitoses. In some portions of the specimen, there were large bizarre multinucleated giant cells and mitoses. These findings are consistent with sarcomatous degeneration not unlike the case reported by Batsakis. Thus, this case fulfills the criteria laid down by Cahan to document induction of sarcoma.

SUMMARY:

A case of angiofibroma treated with surgery and radiation over a span of 13 years has been presented. Areas of sarcomatous degeneration were identified in the specimen last excised in 1981. Using Cahan's criteria we have classified this case as sarcomatous degeneration in an angiofibroma post-radiotherapy. While there are still those who may opt to treat this newgrowth with radiation we feel that surgery should be the treatment of choice. Radiation should be reserved for surgically inaccessible lesions. In presenting this paper we would like to underscore the possibility of inducing malignant degeneration in an otherwise benign lesion.

BIBLIOGRAPHY

1. Arlen M., Higinbotham, N., Huvos, A. et al: Radiation Induced Sarcoma of Bone. Cancer, 28:1087-1099, Nov. 1971.
2. Batsakis, J., Klopp, C., Newman, W.: Fibrosarcoma Arising in a Juvenile Nasopharyngeal Angiofibroma Following Extensive Radiotherapy. Am. Surg. 21:786, 1955.
3. Batsakis, J.G.: Tumors of the Head and Neck - Clinical and Pathologic Considerations. 2nd Ed. Baltimore/London, Williams and Wilsins, 1980.
4. Figi, F., Davis, R.: The Management of Nasopharyngeal Angiofibromas, Laryngoscope 60:794-814, Aug. 1950.
5. Gisselson, L., Lingren, M., Stenram, U.: Sarcomatous Transformation of a Juvenile Nasopharyngeal Angiofibroma. Acta Path Microbiol Scrand 42:305-312, 1958.
6. Hormia, M., Koshinken, O.: Metastasizing Nasopharyngeal Angiofibroma: Case Report. Arch. Otolrayngol. 89:523, 1969.
7. Hutchison, G.: Late Neoplastic Changes Following Medical Irradiation. Radiology 105:645-652, Dec. 1972.
8. Modan, B., Mart, H., Baidatz, D., et al: Radiation Induced Head and Neck Tumors. The Lancet. 23 Feb. 1974.
9. Southwick, H.: Radiation-Associatted Head and Neck Tumors. Am. Journal of Surgery, 134:438, Oct. 1977.
10. Hickey, R.C.: Past Irradiation Neoplasia: A Symposium. Current Problems in Cancer, 3:6 Dec. 1978.

The Phil.
Jour of Oto.
Head & Neck
Surgery

THE HIGH RISK LIST FOR DEAFNESS AN EXCERPT

Nelly R. Ledesma, MA

There is a high incidence of false positives and false negative results in a mass behavioral screening for newborn babies. Due to this reason the U.S. joint committee on newborn hearing screening recommended a more practical and economical method of identifying infants with hearing loss. This idea brought about a high risk list of a small number of categories that would identify a satisfactory number of hearing impaired infants. These categories have been referred to as A B C D ' S of deafness (Downs and Silver, 1972) such as

1. Affected Family – The presence of any form of hearing loss in a family member.
2. Bilirubin Levels – Hyperbilirubinemia, referred to as Jaundice, is a condition where there is an excessive amount of bilirubin in the blood that can be neuro-toxic to the infant at certain concentration. Any free or indirect concentration is judged to be potentially toxic.
3. Congenital Rubella Syndrome or CRS – Rubella at anytime during pregnancy and sometimes hearing loss is the only symptom.
4. Defects of the Ears, Nose and Throat – a malformed or absent Pinna, Cleft Palate or Lip, any abnormalities of the first arch, and other anatomic abnormality of the otorhinolaryngeal system.
5. Small at Birth – Infants weighing less than 1,500 grams at birth have greater risks of hearing defects.

In 1981, the Audiology Staff at the University of Colorado revised the list above to include the U.S. joint committee on newborn hearing 1981 position statement. The revised A B C D ' S of deafness are as follows.

A – Asphyxia, which is a condition where there is a lack of oxygen (anoxia) and an increased carbon dioxide tension in the blood and tissues (known as suffocation). A supply of oxygen is essential to the organ of corti.

B – Bacterial meningitis is an infection resulting in a neonotal meningitis may develop in various times. Meningitis is treated with antibiotics (kanamycin and gentamycin) which are often potential ototoxic drugs.

C – Congenital perinatal infections E.G. gytomegalovirus, rubella, herpes, toxoplasmosis, and syphillis.

D – Defects of the head or neck like craniofacial abnormalities cleft palate, and abnormalities or the pinna

E – Elevated bilirubin exceeding indications for exchange transfusion.

F – Family history of childhood hearing impairment.

G – Gram birthweight less than 1,500

The high risk list should be the basis of any infant screening program. An infant with any of these factors in his prenatal, perinatal or neonatal course is at increased risk for deafness. These factors are only seen as a list and the importance of each individual factor is overlooked. The information is the essential part of not only the initial infant screening but also the audiological follow-up and or medical history of any age patient. Within these categories lies a wealth of information that can aid the audiologist, speech-language pathologist, otolaryngologist, obstetrician in the identification and management of a patient.

SUMMARY

TABLE 1 is a reference summary of the risk factors and their common effect on the hearing mechanism. However, this categorization is merely a guideline and each risk factor should be viewed as any human being is viewed-unique, variable, and with endless possibilites.

TABLE 1
Most Common Manifestations of Hearing Loss

High Risk Factor	Con-ductive	Sensori-neural	Mixed	Uni-lateral	Bila-lateral	Degree
Asphyxia		+			+	Mild-Profound
Bacterial Meningitis		+			+	Severe-Profound
Toxo*		+			+	Moderate-Profound
Syphilis		+			+	Severe-Profound
Rubella*		+			+	Profound
CMV*		+		+	+	Mild-Profound
Herpes*		+		?	?	?
Defects of Head & Neck	+	+	+	+	+	Mild-Profound
Elevated Bilirubin		+		+	+	Mild-Profound
Family History*	+	+	+	+	+	Mild-Profound
Low Birthweight		+			+	Moderate-Profound

*These factors may exhibit progressive hearing and should be followed serially.

Once a child is identified as "At Risk" and the initial screening is accomplished, further testing is indicated for those who fail the screening. Follow-up is by far the most difficult part of any screening program but without reservation it is the most important aspect if a screening program is to be successful.

A minimum follow-up schedule should include repeat testing at six months of age. At this time the Audiologist should decide to test further or to discontinue follow-up based on the particular type of testing done, and the results. In cases of possible progressive loss (see Table I) automatic tympanograms and serial audiograms should be done every few months until speech and language skills are appropriate.

Lastly, although the high risk list cannot identify every cause of hearing loss, it is the basic tool in infant screening and early identification. An understanding of each factor and the manifestations its exhibits eases the task of the audiologist and aids in the diagnosis of hearing loss in children.

REFERENCES

ABRAMS, I.F. Nongenetic Hearing Loss. In B. Jaffee (Ed.) *Hearing Loss* in Children, Baltomore, University Park Press, 1977.

BABSON, S.G. "Diagnosis & Management of the Fetus & Neonate at Risk." St. Louis Missouri, C.V. Mosby Company, 1980.

GERKIN, K.P. *"The High Risk Register for Deafness,"* American Speech-Language Hearing Association, Volume XXVI, No. III, March, 1984.

LEVINE, R. L. Bilirubin, Worked Out Years Ago? Pediatrics, 1979, 64, 380-385.

AUDIOLOGIST MARKS 10TH YEAR OF PRACTICE IN THE COUNTRY

Nelly R. Ledesma celebrated her first decade of practice as a professional audiologist last May imbuing interest and renewing enthusiasm to a field involved in the care and rehabilitation of persons with communication disorders.

Audiology dawned as a profession in the Philippines when Ledesma obtained a master of arts degree in Speech Pathology and Audiology in 1974 at the Kent State University in Ohio, U.S.A. Hence and undeniably, she became the first Filipino U.S.-trained audiologist when she later joined the Tamesis Clinic with that designation.

To make meaningful a milestone in her career, an audiology symposium was sponsored by her company, the Ledesma Audiological Center, Inc. (LACI), using the trade name King-Aid Philippines, at the Century Park Sheraton Hotel Ballroom last May 21, 1984. It was also in keeping with the celebration of Better Speech and Hearing Month held annually in May in the United States.

NELLY REYES LEDESMA

Guest speaker was Dr. Kenneth W. Berger, Director of Audiology at Kent State University since 1962. Not a few participants and attendees in the symposium knew that Dr. Berger provided the impetus for Ledesma to pursue her studies abroad.

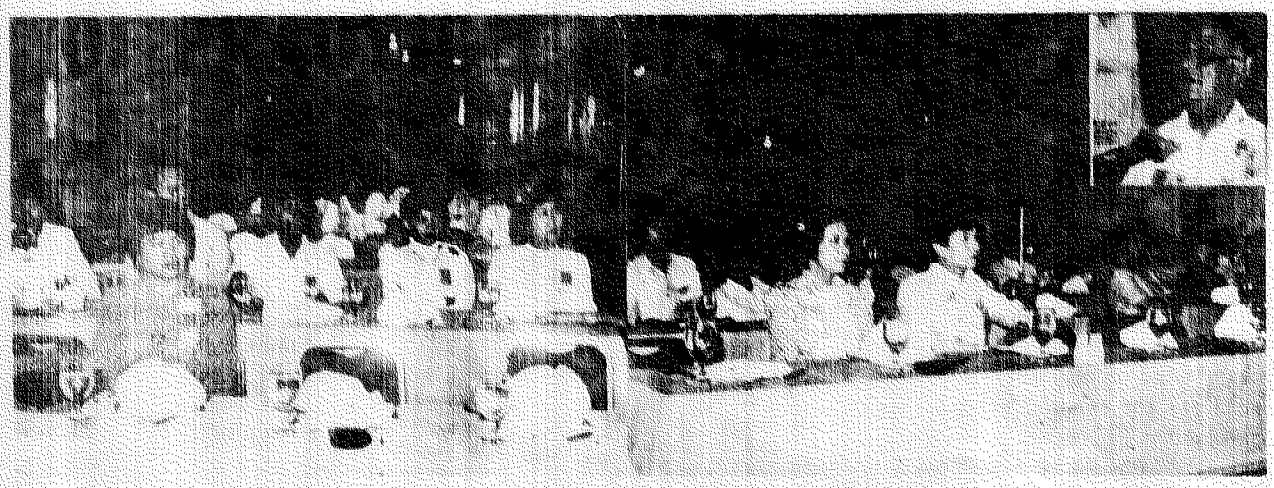
Berger and Ledesma met in 1972 during a seminar at the Philippine School for the Deaf where the former was a speaker and the latter was a demonstration teacher for the deaf.

In the open forum Ledesma commented that it was rather anachronistic for Berger to be talking of audiology in a country where no one professed to be an audiologist yet. Dr. Berger answered, "Young lady, please see me after the seminar and we'll do something about that."

Before long the two met again, this time as a professor and a postgraduate student at the Kent State University's School of Speech Pathology and Audiology.

In his keynote address, "The Profession of Audiology," Berger said he was proud to be with the University which produced the first Filipino audiologist. He also said that he is a "Filipino sa damdamin." Ledesma, in her introduction to Berger, called her former mentor "a professor for all seasons." Thus the ambience during the symposium was nostalgic rather than formal.

On the subject of hearing aids, the American audiologist emphasiz-



Keynote speaker Dr. Kenneth W. Berger (inset) stresses a point during the May 21 Audiology Symposium held at the Century Park Sheraton Hotel Ballroom. Participants included EENT resident physicians, ENT specialists, language therapists, special education teachers and hearing impaired individuals.

ed that every child or adult who has a hearing loss below 30 dB should be recommended the correct hearing aid in order to be able to modify his ability to understand speech. Postponing the use of the aids, Berger said, may be a disadvantage to the user if he decides to get later due to some adjustments the patient has to undergo after the hearing aid fitting has been completed.

He also stressed the significance of the formula for prescribing hearing aids. Berger's monograph *Prescription of Hearing Aids* has been translated in Spanish, French, Japanese and very soon in German.

As a resource person, Berger traced the history and evolution of hearing aids and instruments, shown through slides and actual models, from the "ellipsis otica" to the most modern state-of-the-art intracanal aids.

The symposium's other resource persons and their topics: Dr. Ernesto Nueva Espana – Prediatric Audiometry; Dr. Carlos Reyes – Brainstem Evoked Response Audiometry; Rev. Ada Coryell – Education and Auditory Rehabilitation; and Nelly R. Ledesma – The High Risk List of Deafness.

Capping the symposium was the presentation of a plaque of appreciation to Dr. Berger from LACI through its chairman, Engr. Edgardo G. Ledesma. The award cited Berger for his "untiring and unselfish efforts in his field" which redounded to the benefit of many a hard of hearing individual.

Participants included resident physicians in EENT departments of hospitals, ENT specialists, language therapists, special education teachers, guests from the Philippine Normal College's Special Education Department, Friends of Dr. Berger in the Philippines, hearing aid users from King-Aid and the entire staff of King-Aid Philippines except the Davao branch.

Engr. Edgardo G. Ledesma (second from left), chairman of the board of the Ledesma Audiological Center, Inc., presents the plaque of appreciation to Dr. Berger. Assisting the presentor are Alfonso Agringo (left), who read the citation, and Mrs. Nelly R. Ledesma.

DR. K. W. BERGER GUEST SPEAKER

- Received his Ph.D. degree in Audiology from Southern Illinois University.
- Since 1962 Director of Audiology at Kent State University, Kent, Ohio.
- Has more than 100 published articles on speech pathology and audiology, plus several book chapters and monographs.
- Author of "The Hearing Aid: Its Operation and Development," published by the National Hearing Aid Society, 4th edition 1984.
- Author of "Speechreading: Principles & Methods," published by National Education Press.
- Monograph titled "Prescription of Hearing Aids" is now in its fourth edition, and has been translated into French, Spanish, Japanese, and German. In addition, several computer programs based on the procedures have been published.
- Curator of the hearing aid museum at Kent State University, the largest in the world; more than 2,200 different hearing aids on display.
- Has put on workshops on hearing aid fitting in many of the states in the U.S., in Germany, in Denmark, in Canada, in England, and in Japan.

Alcon Gives You The Edge For Ophthalmic Surgery.

Our newest needle edge is an ultra-thin 1mm (.004 in.) wire needle for specialized procedures.

Like all Alcon needles it has a superior cutting edge that extends from the point to the widest portion, retaining its sharpness pass after pass.

Check all our edges for yourself. For more information, ask our Medical Service Representative, or dial Tel. No. 88-92-26.

Alcon Surgical

The Needle For Ophthalmic Surgery

THE PHILIPPINE BOARD OF OTOLARYNGOLOGY-HEAD & NECK SURGERY

ANNOUNCEMENT

The next certifying examination (written and oral) in Otolaryngology will be given October 1983. Inquiries may be made through Dr. Mariano Caparas c/o Dept of Otolaryngology, Ward 3, Philippine General Hospital, Taft Avenue, Manila.

The Phil.
Jour of Oto.
Head & Neck
Surgery

A CASE THAT MIMICS NASOPHARYNGEAL CARCINOMA*

Wilfredo Z. Pinano, M.D.**
Eusebio E. Llamas, M.D.***

Introduction:

Malignant lymphomas may present as a primary malignancy in the head and neck. Lymphomas are usually classified according to whether they are Hodgkin's or non-Hodgkin's lymphoma. Hodgkin's lymphoma is characterized by the presence of the morphologic feature, the Reed-Steinberg giant cell. Non-Hodgkin's lymphomas take the form of a cohesive tumorous lesion composed mainly of lymphocytes and rarely histiocytic cell types.

Hodgkin's lymphomas maybe classified into four types: (1) lymphocytic predominance, (2) nodular sclerosis, (3) mixed cellularity, and (4) lymphocytic depletion.

Non-Hodgkin's lymphomas could be divided into two: (1) reticulum cell sarcoma and (2) lymphosarcoma. Reticulum cell sarcomas are lymphomas that arise from mesenchymal cells such as the reticular cells of the bone marrow and microglia of the central nervous system. Lymphosarcomas morphologically would show a typical lymphocytes undergoing active mitosis replacing connective tissue and obscuring distinct outlines.

History:

Our patient is a 50 year old male, farmer, from Iloilo who was admitted at the UST Hospital because of difficulty of swallowing.

A month prior to admission, the patient started to experience a dull pain over the back of the right ear and nape. This lasted for a few minutes to an hour and was spontaneously relieved by rest. The condition persisted until the time of admission. There was no fever nor vomiting.

Two days later, he started to experience fullness of the right ear accompanied by an irritating, buzzing sound. During the succeeding days, he noted that his hearing on the right ear was *not* as keen as before. This hearing problem progressively became worse up to the time of admission.

Three weeks prior to admission, other than the above symptoms, his relatives noted that his right eye was medially deviated. Four days later, he could *not* close completely his right eye. Everytime he would drink, liquid would drip from the right angle of the mouth. He also had difficulty discerning the taste of food in the anterior right half of the tongue.

Two weeks prior to admission, he started to have difficulty in swallowing. He felt as if there was a lump in the throat, occasionally while eating, he would choke. His voice was also noted to have a nasal quality. On the succeeding days, he noted his tongue to have weakened and he felt as if it was shortened. With the progression of the above symptoms, the patient sought consultation at the STUH-CD and was subsequently admitted.

Past History:

The patient had PTB in 1979. Medications were taken for two months. He had otitis media of the R ear and cataract of the R eye in 1980.

Pertinent Physical Findings:

Previous perforation at the posterior inferior quadrant with secondary membrane in the R ear

Palpate cervical lymph nodes in both anterior and posterior triangles, as well as in the supraclavicular area

Diminished breath sounds over the R lung field

Neurologic Examination:

Cerebrum – patient is alert, oriented to 3 spheres, good memory for recent and remote events

Cerebellum – he can do FNT' APST, HKST (finger to nose test, alternate pronation-supination test, heel to knee to shin test) involvement are all on the right.

Cranial Nerve

Trigeminal – diminished sensation over R half of the face; weak masseter; absent R corneal reflex

Abducens – weakness of the R lateral rectus

Facial – peripheral facial paralysis

Auditory – mixed hearing loss

Glossopharyngeal – sluggish gag reflex

Spinal Accessory – atrophy of the R sterno-

*3rd Prize
**Former Resident, Dept. of E.N.T., U.S.T. Faculty of Medicine and Surgery
***Chairman, Dept. of E.N.T., U.S.T. Faculty of Medicine and Surgery

cleidomastoid and trapezius muscles
Hypoglossal – atrophy of the R half of the tongue

Laboratory Examinations:

The CBC is essentially normal.
The ESR is elevated at 50 mm/hr.
The CSF is essentially normal.
The chest X-ray revealed fibrocalcific densities of the R apex.
The skull X-ray is suggestive of increased intracranial pressure. A parasellar mass, however, could not be totally ruled out.
Nasopharyngeal biopsies were done 4x which revealed chronic inflammation.
R cervical lymph node biopsy revealed angiofollicular hyperplasia.
Cranial CT Scan showed an enhancing R large nasopharyngeal mass lesion, with extensive destruction of the sphenoid, R temporal, petrous and basal occiput with basal intracranial extension.

The course in the ward was a progression of the above signs and symptoms with the patient dying on the 71st hospital day from cardio-respiratory arrest.

Discussion:

Our patient was admitted mainly because of neurologic manifestations of the disease particularly the involvement of the cranial nerves V to XII. With the P.E. finding of a big nasopharyngeal mass on posterior rhinoscopy, documented by skull x-ray and CT scan eroding the structures of the right base of the brain, one cannot help but give primary consideration to a metastatic lesion from a contiguous structure, that is, the nasopharynx. Diagnosis of a nasopharyngeal carcinoma is in order. Distant structures that can give metastatic lesions in the base of the skull are the lungs, breast, thyroid, gastrointestinal and genito-urinary tracts. Infiltrative lesions such as reticulosis, leukemia, and multiple myeloma are also considered. With repeated negative nasopharyngeal biopsies, a transpalatal approach was suggested in the hope of getting a positive result. However, our patient expire before such procedure could be carried out.

Post-mortem examination of our patient shows a building soft mass covering the R supra, pre, and infra-auricular areas. It is most prominent in the infra-auricular region where it measures 6 centimeters in its widest diameter. On dissection, the mass which is grayish-white, firm and fleshy, is noted to extend towards the nasopharynx as well as towards the base of the brain. Its borders are poorly delinated. On opening the skull and removing the brain, we noted a soft tissue mass bulging into the middle and posterior cranial fossae with lifting of the skull bones.

Microsections of the soft tissue mass disclosed a tumor composed of a diffuse monotonous proliferation of lymphoblasts and large, atypical lymphocytes, with vesicular nuclei and prominent nucleoli. The are frequent mitoses, many of which are bizarre. These lymphoma cells infiltrate into the nasopharynx and adjacent salivary gland tissue and into the bony tissue of the middle and posterior cranial fossae.

The histologic diagnosis is Malignant Lymphoma, Diffuse, Lymphocytic, and Well-Differentiated.

Going back to our case, there were some pitfalls in the diagnosis. The negative nasopharyngeal biopsies on several occasions should have alarmed the clincian of other conditions that would simulate a nasopharyngeal carcinoma. According to Paparella, et al, 5-100% of nasopharyngeal malignancies are malignant lymphomas. Our patient did not manifest any single episode of epistaxis. This may connote that the tumor lacks mucosal ulceration.

We therefore hope, that with this presentation, we should always consider other possibilities when confronted with a mass in the nasopharynx.