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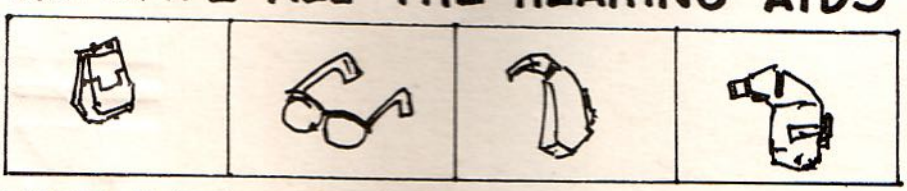

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All manuscripts and other editorial matter should be addressed to Angel Enriquez, M.D., Editor-in Chief The Philippine Journal of Otolaryngology – Head & Neck Surgery, Dept of Otolaryngology, Philippine General Hospital – Ward 3, Taft Avenue Manila.

THE PHILIPPINE JOURNAL OF OTOLARYNGOLOGY HEAD & NECK SURGERY

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EDITORIAL:

THE PHILIPPINE JOURNAL OF OTOLARYNGOLOGY – HEAD & NECK SURGERY

Cognizant of the enthusiasm of Filipino Otolaryngologists to put out a publication, which they can proudly call their own, the Philippine Society of Otolaryngology & Bronchoesophagology, Inc. with the cooperation of the Dept. of Otolaryngology – University of the Philippines, College of Medicine – Philippine General Hospital, Medical Center and with the blessings of the Philippine Board of Otolaryngology-Head & Neck Surgery, takes great pleasure in bringing to its readers the maiden issue of this "The Philippine Journal of Otolaryngology-Head & Neck Surgery."

Ambitiously conceived in an era of change, the editorial board opted to retain the name by which the specialty has been known for decades but with an addition Head & Neck Surgery – if only to move with the times and to impress on all that Otolaryngology, aside from being distinct and a separate discipline from that of Ophthalmology, is also an expanding regional entity. The colors chosen for its cover – red (blood), yellow (pus – and white (mucus) connote that the field of Otolaryngology is both surgical and a medical subspecialty.

It is hoped to be the repository of experiences and knowledge of individuals comprising its general membership as well as those still in training that it may be shared unselfishly with others. It is also hoped to contain valuable information applicable to Filipinos and thus contribute in the upgrading of health care in the Philippines.

However, endeavors, such as this is bound to fail unless nurtured properly and adequately especially in its infancy. This is reason enough for the cooperative effort between the national organization of Otolaryngologists and the Ears, Nose and Throat Dept. of the U.P.-P.G.H. Medical Center. With its vast wealth of clinical material, which up to this time has remained largely unrecorded, this undertaking hopefully will become a dream come true.

Let it not be said though, that this is the official organ of said department as its staff, composed of giants in the specialty, is just too willing and happy to share with others whatever may come their way in their weekly conferences and ward rounds. Understandly, contributions from other quarters, notably the medical institutions and teaching hospitals – are most welcome indeed. Concerned members of the society should get involved and take active part in nurturing this objective and with their unflinching support no goals will be unattainable.

To the postgraduate trainees, this will be an opportunity to break into print. More importantly, it will be an experience they will never get in the wards and operating rooms – a feel of medical journalism. Their ingenious researches – which for lack of sophistication and statistically significant number of cases presented due to time constraint, may never find print in the more reputable publications – contain useful information applicable to Filipinos and perhaps our Asean neighbors as well. If for nothing else, but for this – to them this issue is wholeheartedly dedicated.

Programmed initially to come out just once a year, its readers are assured of a well rounded up selection of topics – original articles, on going and complete researches and hopefully in the succeeding issues, feature departments like Grand Rounds, Book reviews, X-ray of the year, etc. A President's page will be a regular feature for commentaries relating to the activities and program of the Philippine Society of Otolaryngology & Bronchoesophagology, Inc.

A.E.

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 Ledesma Audiological Center, Inc., King Aid Philippines, particularly to its President and Audiologist, Nelly R. Ledesma, for the support & assistance, without which this would not have been possible.

PRESIDENTS' PAGE

INAUGURAL ADDRESS

Ladies and Gentlemen:

According to Thoreau, "Dreams are the touchstones of our Character."

Thus it was twenty-five years ago a group of men with the same dream, ideals and objectives founded a society dedicated to the promotion and practice of Otolaryngology and Bronchoesophagology.

Though they were few in number this only served as an incentive to pursue with vigor the attainment of their objectives.

There were up's and down's during the ensuing years that would serve to weaken even the bravest heart. I admire my predecessors that inspite of the difficulties, they accomplished much to foster the ideals of the society. For this I salute them and hope that I am equal to the task. The growth in numbers was very slow for several probable reasons.

With the exception of one hospital for otolaryngological training, one had to leave for foreign shores to be trained in this specialty. Was it because of the rigid requirements set by the society, to the apathy of the training hospital administrators, or to the lack of communications with the students, the schools and the hospitals or perhaps even the terrific expenses incurred on behalf of the specialist in setting himself up in this specialty field? Whatever the reason might have been at the time, re-evaluation became paramount.

The society was founded on a dream – an abstract with a definite goal in their hearts but no clear cut methods to achieve that dream.

Since it was a dream its burning desire was very hard to extinguish.

"As dreams are the stuff reality is made of" I too would like to join them and dream of the different wishes for its future.

I dream that the members participate more actively and allocate some of their precious time for service to the society. I quote Shaw when he said that "The worst sin towards our fellow creatures is not to hate them, but to be indifferent to them; that is the essence of inhumanity."

In striving to build up our society as a forceful and respected specialty of medicine in the country; we must strive to overcome a complacent attitude that representation of the specialty society and medical profession for its needs, will always be taken care of by someone else.

We must strive to upgrade our standards expected of our training schools and of the trainees, to keep abreast of new trends in technology and medicine;

To do this we must keep abreast ourselves, we must be the leaders and set our standards high – while at the same time holding out a hand to help those in training programs to achieve the standards we have set.

I dream that the scientific meetings be regular and meaningful.

I dream that more medical schools and training hospitals participate in the presentation of papers and clinical studies by the residents.

I dream that the training hospital through our persuasion realize

the necessity of putting up a separate training program for Otolaryngology for a better health delivery system.

I dream that the society put out their own journal to encourage research and publication of scientific papers as I quote Johnson in that "The next best thing to knowing something is knowing where to find it". Because of what Emerson said, "I suppose every scholar has had the experience of reading something in a book, which was significant to him, but which he could never find again, since he is sure that he read it there; but no one else ever read it, nor can it be found again," So to assure ourselves of always finding the information we need, I dream that the society should publish a book in Otolaryngology using Philippine cases and statistics if available for the use of student's and practitioners.

The realization that "no man is an island" must guide us to seek more cooperation and camaraderie with the other societies.

I know there are many other things the society would like to do which at the moment are too detailed to discuss here but I am sure with the cooperation and dedication of the members working together we can accomplish our dreams and goals. Let these dreams be the dreams of our society. Let me leave you with this thought from Thoreau, "I have learned this at least from my experience that if one advances confidently in the direction of his dreams, and endeavors to live the life which he has imagined, he will meet with a success unexpected in common hours."

My friends let us dream together.

Dr. Alelardo B. Perez

MAXILLOFACIAL FRACTURES*

Mariano Caparas, M.D. **

My interest in maxillo-facial fractures dated back to my early years in the old Department of Eye, Ear, Nose and Throat. I came in as a resident physician after graduation in 1958 and promptly got introduced into head and neck injuries and a father-and son relationship with my mentors Dr. Carlos Yambao and Dr. Jose N. Cruz. The chairman of the department then and for sometime was Dr. Geminiano de Ocampo who was both an inspiration and a desparation but more of the former than the latter.

I could recall in some details that 20 years ago the attitude and philosophy of my EENT consultants to the treatment of facial fractures was one of solid conservatism if not total indifference. It was the use of ashe forceps to reduce nasal bone fractures and nothing more and Darton's bandage for the fractures of the mandible. Luckily some of them got well but one had to wonder why, and how, the other patients did not fare well and so we started to look for better explanation and better treatment.

The proper incentives came when the Department of EENT became separated into the Department of Eye and the Department of Ear, Nose and Throat in 1961. More beds were allocated to patients other than the usual tonsils, polyps and ear infection cases and the consultant and resident members of the staff were now free to pursue what we might call non-traditional approach to difficult ENT problems. The head and neck cancer surgery blossomed with the guidance of Dr. Tierry F. Garcia and Dr. Napoleon Ejercito and so was the interest in the management of acute facial fractures. The cases were there, the incentives were there but what was missing was the expertise. Traditionally there was one way to acquire expertise and that was to go abroad and study under certain qualified mentors. Twenty years ago even in the U.S. there was not much on post-graduate courses about the management of maxillo-facial fractures as far as I could gather and so the next best thing for me to do was secure a scholarship in a related subject at the University of Toronto in 1966. This was maxillo-facial prosthesis design, making and fitting.

The other traditional source of expertise is of course more difficult to acquire and that is going to the textbooks and journals. This was not that easy to do then for our library was not a good source of reference books until later but we somehow managed to gather our references partly by buying the books expensive as they were.

At the same time I tried to learn about facial osteology by buying two skulls from the Department of Anatomy. To summarize this is how we build the specialty of acute maxillo-facial injury. We acquired two skulls, a few reference books in the subject by Conley, Natvig and Dingman and the available journals. The availability of clinical materials needless to underscore was the crucial factor that made it all possible.

In this 20 years of experimentation we have come up with definite philosophy and treatment approach to fractures of the nasal bones, ethmoid complex, fracture of the zygoma, frontal sinus plate, optic nerve compression syndrome and others.

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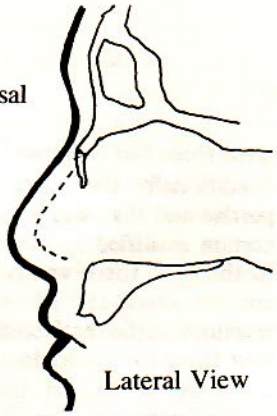
* 13th Vivencio Alcantara Memorial Lecture delivered at the PICC December 3, 1980.

** Chairman & Assoc. Professor, Dept. of Otolaryngology, U.P.-P.G.H.-Medical Center
President, P.S.O. & B

The following illustrations are examples:

FRACTURE OF THE NASAL BONES

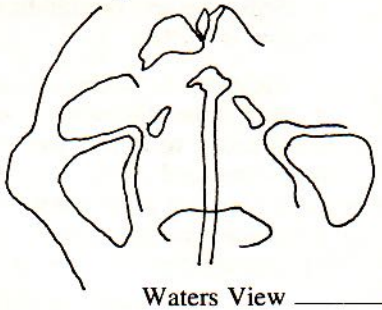


Depressed nasal bone tip

Lateral View

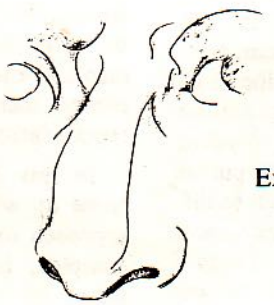
Saddle depression of the nasal dorsum

Shortening of the columella



Waters View

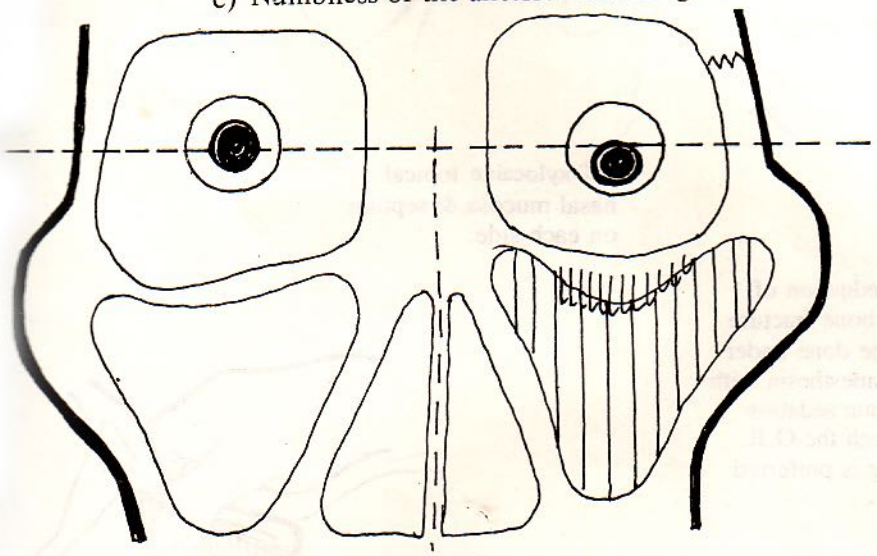
X-ray views that are useful in detecting nasal bone fractures are the soft tissue lateral and the waters view

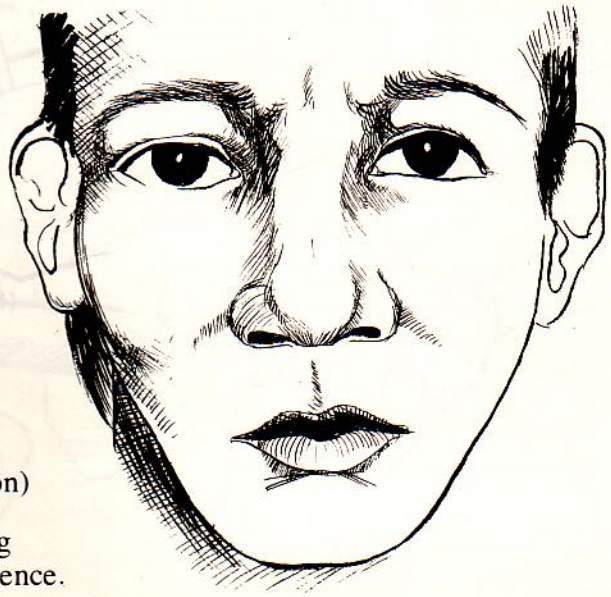


External deflection of the nose to one side

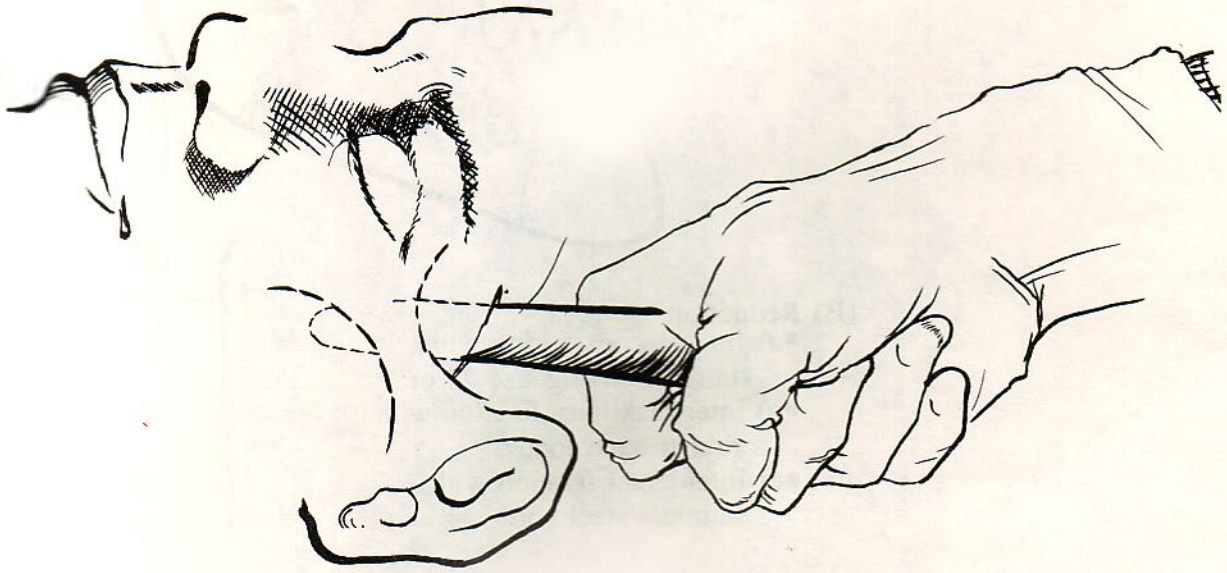
Deflected nasal septum

(A) Blow out Fracture
of the orbital Floor
Signs/Symptoms:
a) Diplopia on looking up
b) Enopthalmus
e) Lower level of the pupil
of the affected eye
d) X-ray shows hazy
maxillary sinus
c) Numbness of the anterior facial region





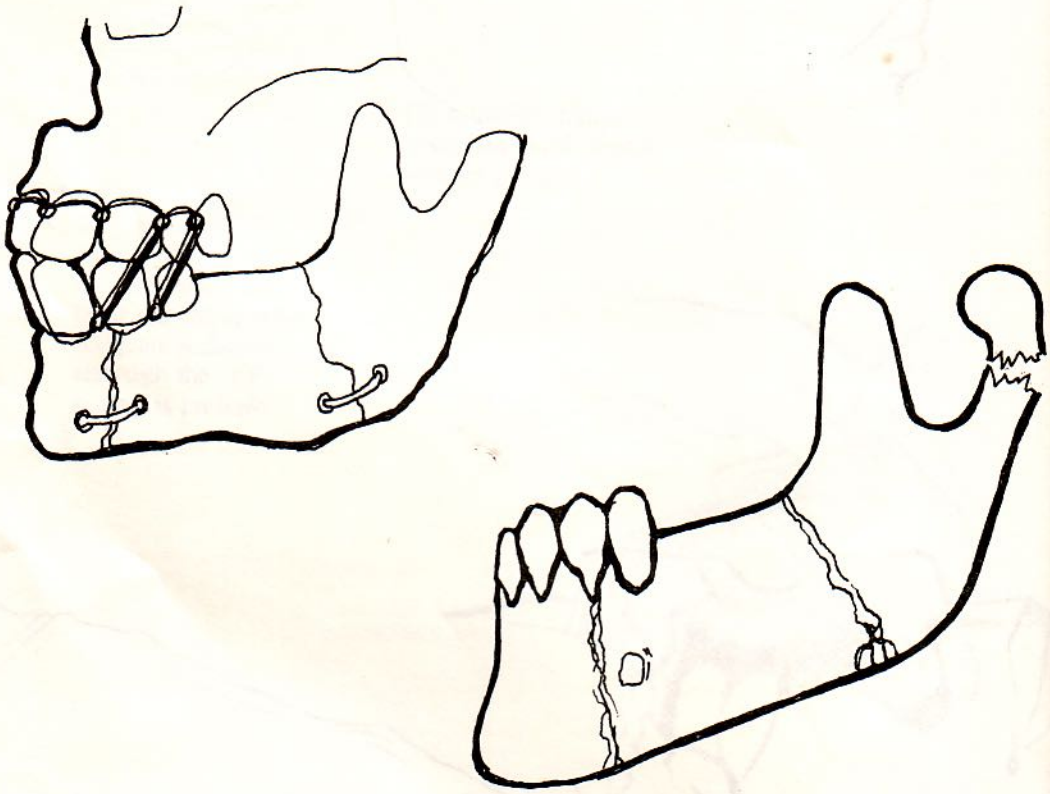
(B) In tripod fracture (zygomatic
bone fracture with inward rotation)
you may find all the above
signs & symptoms plus flattening
of the zygomatic (malar) prominence.



FRACTURE OF THE MANDIBLE

(A) Remarks

- Condyle neck fracture is characterized by ear pain & swelling, trismus is a prominent sign.
- Fracture of the angle of the
- Mandible is usually accompanied by fracture of the mentum on other side. The prominent sign is severe malocclusion.

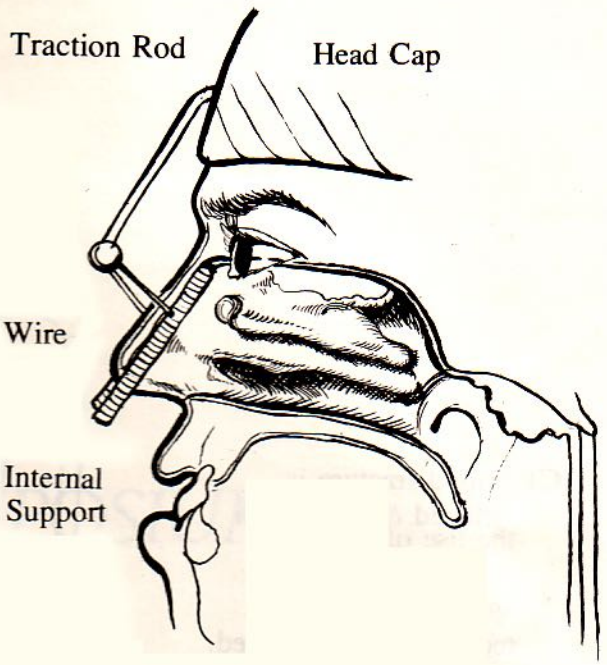


(B) Reduction

- a) Interosseous wiring with stainless steel gauze 24 or 26
- b) Inter maxillary fixation with rubber band loops.
- c) Interdental fixation with stainless steel wire.

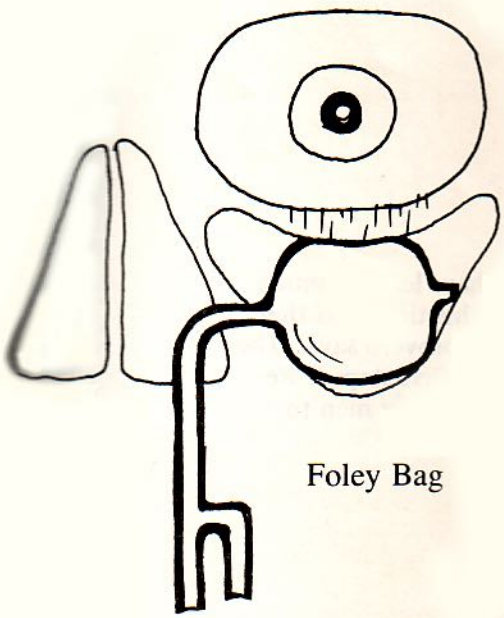
HEAD TRACTION & USE OF BALLOON IN

MAXILLARY SINUS WALL FRACTURE



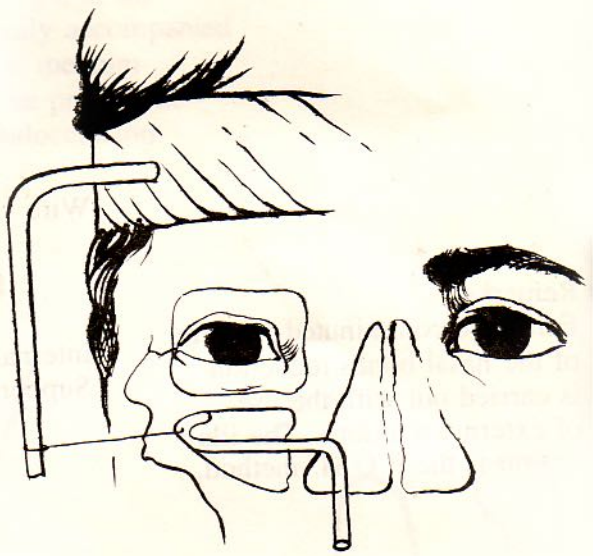
(A) Remarks

For some comminuted fracture of the nasal bones reduction is carried out with the use of external tractions. The illustration is the P.G.H. method.



(B) For fracture of the orbital floor a Foley Bag inflated with water is the preferred support.

(C) Tripod fracture is reduced & fixed with the use of external traction — headcap splint ala P.G.H. technique as illustrated.



Editor's Note:

We can say with reservation that we have learned much about facial fractures and we can also say this time that there is still much to be learned. The old Chinese proverb says "The journey of a thousand miles begins with the first steps." We have made the first steps. May we ask the younger men to finish the journey to the thousand miles?

SYMPOSIUM ON ATROPHIC RHINITIS

ATROPHIC RHINITIS : A Bacteriological Study

ZENAIDES T. WI, M.D. *
RODOLFO P. NONATO, M.D.*
BRENDAN R. FERROLINO, M.D.* *

INTRODUCTION

As early as 1876, Fraenkel described atrophic rhinitis by the triad of symptoms: foul odor, atrophy of nasal mucosa, and crust formation. Histologically, the pseudostratified columnar ciliated epithelium of the normal nasal mucosa is transformed into stratified squamous epithelium, non-keratinizing. The healthy glandular structures in normal nasal mucosa are also transformed into atrophic mucus and serous glands. The clinical presentation is unique and offending such that the experienced clinician will seldom miss the diagnosis.

The etiology of atrophic rhinitis, however, has remained an enigma. Various investigators, through the ages, have presented different theories of causation, which up to the present are still unclear or unproven presumptions. Some theories even conflict with each other. The more commonly accepted theories are the following:

1. Deficiency Theory
    a. Iron deficiency
    b. Vitamin A deficiency
2. Endocrine Theory
3. Infection by Specific Organism Theory
4. Sinus Infection Theory
5. Developmental Theory
6. Autonomic Imbalance Theory
7. Collagen Disease Theory

OBJECTIVES

Bearing the above theories in mind, the authors have decided to investigate the "Infection by Specific Organism Theory," and have set the following objectives for the study:

1. To study the bacteriological characteristics of clinically diagnosed cases of atrophic rhinitis at the ENT-Out Patient Department of the Philippine General Hospital.
2. To investigate the veracity of the "Infection by Specific Organism Theory"
3. To determine the antibiotic sensitivity of the organisms isolated.

MATERIALS AND METHODS

Cases were selected and studied as they were diagnosed clinically as atrophic rhinitis at the ENT-Out Patient Department of the PGH over a period of eight months from February 1980 to September 1980. The criteria for patient selection were the following:

1. Presence of two or more of the triad of atrophic rhinitis: nasal crust, foul odor, atrophied turbinates.
2. No previous history of nasal surgery, except for antrostomy.
3. No previous medical treatment for the last two weeks.

Nasal swabs were taken from the exudates and sent to the Bacteriology Section of the PGH Out Patient Department where culture and sensitivity studies were done. The isolation media used were MacConkey's agar and 5% sheep's blood agar. The isolated organisms were run through a series of biochemical tests for identification. No anaerobic and serologic studies were done since the facilities for such tests were not available.

EVALUATION OF RESULTS

There were 14 females and 3 males in the study. The age incidence showed the predominance of the disease among patients in their second to third decade of life (76%).

Bacteriological studies revealed that 8 cases (47%) of the 17 cases harbored Klebsiella species as their main pathogen. Five cases (29%) revealed normal flora. Two cases (12%) had Klebsiella rhinoscleromatis, and one each for Pseudomonas aeruginosa and Proteus rettgeri.

Antibiotic sensitivity studies showed that the Klebsiella species (8 cases) were mostly sensitive to Sisomycin (8), Tobramycin (8), Gentamicin (7),

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** Formerly Chief Resident, Dept. of Otolaryngology, U.P.-P.G.H. Medical Center

and Cephalothin (5). Some were resistant to cephalothin (2), trimethoprim sulfonamide (2), tetracyline (2), and Colistin SO_4 (1).

The Klebsiella rhinoscleromatis showed sensitivity to tetracycline (2), cephalothin (2), Gentamicin (2) and Kanamycin (1), They were resistant to Carbenicillin (2) and Kanamycin (1). No sensitivity studies for streptomycin were done.

The sensitivity studies for the pseudomonas and proteus species could not be properly evalauted since there were only one of each.

DISCUSSION

The age and sex distribution revealed that there were more females afflicted with the disease and at their adolescent years. In a study by B. Cruz, et al (1979),* this same trend was observed in 37 cases of atrophic rhinitis diagnosed at the ENT-Out Patient Department of the Philippine General Hospital. Foreign data shows the same observations. The sex and age incidence supports the hormone theory; the basis of which lies in the hormonal imbalance during this stage of life. Such imbalance, other authors claim, is more pronounced among females. Either estrogen lack or excess may be the etiologic factor. However, up to the present, no definitive evaluation has been conducted regarding this observation.

The proponents of the "Infection by Specific Organism Theory" state that Klebsiella species, more specifically Klebsiella azaenae, is the etiologic agent. Some, on the other hand, claim that it may be caused by a virus, an atoxic form of C.diptheriae, Perez-Hofer bacillus, coccobacillus, and other organisms; however, no absolute findings have been presented to support their contentions. In this study, 47% showed the presence of Klebsiella species. This strongly supports the infection by specific organism theory and as a corollary, Klebsiella may be the etiologic agent of atrophic rhinitis. Unfortunately, facilities to speciate the Klebsiella species were not available. However, the presence of Klebsiella in 47% of the cases merits a strong consideration for the "Infection by Specific Organism Theory." However, 29% of cases showed normal flora. This observation surely casts doubts on the theory With such conflicting data, the authors, therefore, can only presume that atrophic rhinitis can be caused by hormonal imbalance, infection by specific organism, or by multifactorial mechanism which up to the present are still undiscovered. This paper have just added some data for the benefit of future researches on this enigmatic disease.

A significant finding in this research was the finding of 2 cases of Klebsiella rhinoscleromatis, the etiologic agent of rhinoscleroma. In retrospect, rhinoscleroma presents in 4 stages: catarrhal, atrophic, granulomatous, and fibrotic. Some cases of rhinoscleroma may, therefore, present clinically as atrophic rhinitis during their atrophic stage. Culture studies play a great role in differentiating this disease entity from that of true atrophic rhinitis. Nasal biopsies for tissue culture and histopathologic evaluation will greatly help in the positive identification of rhinoscleroma. The yield for both tissue culture and histological study will be more during the granulomatous stage. The proper identification of rhinoscleroma should be considered seriously since the management and prognosis of this disease entity would be quite different from that of true atrophic rhinitis. It is in this light that the authors reiterate the value of routine culture and sensitivity studies on all cases of clinical atrophic rhinitis and close follow-up of these cases to observe some Atrophic rhinitis with no yield for rhinoscleroma which will later progress to the granulomatous stage.

The antibiotic sensitivity studies should be critically evaluated as regards their cost, availability, and manner of administration. The sensitivity studies of Klebsiella species revealed that Sisomicin, Tobramycin, and gentamicin are the most favored. However, these drugs are expensive and are not readily available in all parts of the country, and are in parenteral form of administration. Cephalothin ranks number four and with 2 cases of resistance. However, it is more readily available, in both parenteral and oral form, and costs less than the others. Thus, the clinician should exert judgment in choosing the antibiotic to prescribe.

The Klebsiella rhinoscleromatis showed sensitivity to tetracycline which is actually one of the drugs of choice for rhinoscleroma. The other drug is streptomycin. The sensitivity studies conforms with the other studies done abroad.

CONCLUSIONS:

In the bacteriological study of 17 cases of clinically diagnosed cases of atrophic rhinitis the authors have made the following observations:

1. The age and sex incidence conforms with the observation of other investigators; the predominance of females at their adolescent years lends support to the endocrine theory.
2. The predominance of Klebsiella species, 47%, in the culture studies strongly sup-

* See following article

ports the "Infection by Specific Organism Theory," more specifically by the Klebsiella species.

3. The presence of normal flora in 29% of the cases casts doubts on the "Infection by Specific Organism Theory." Thus, atrophic rhinitis may be caused by a multi-factorial mechanism which is still undiscovered.
4. Rhinoscleroma may masquerade as atrophic rhinitis clinically during its second stage.

   The value of routine culture and sensitivity studies in cases of clinically diagnosed atrophic rhinitis is greatly emphasized.
5. The clinician should critically evaluate the antibiotic sensitivity studies as regards their cost, availability, and manner of administration.
6. The cases of Klebsiella rhinoscleromatis all showed sensitivity to tetracycline which conforms with the findings of other investigators that tetracycline and also streptomycin are still the drugs of choice.

The authors hope that this study has provided additional information on this enigmatic disease.

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ATROPHIC RHINITIS: Use of Erythromycin and Bromhexine Hydrochloride

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Joselito A.C. Jamir, M.D.**
Generoso T. Abes, M.D.***
Zenaides T. Wi, M.D. ****

I. INTRODUCTION

The Otolaryngologist encounters various diseases which he is well equipped to diagnose and treat except for a few pathologic processes. One of these is atrophic rhinitis.

The pathogenesis of atrophic rhinitis remains multifactorial and its exact etiology is obscure. Considering the various theories expounded with regard to its etiology, several treatment regimens were postulated in consonance with one or more of these theories. Consequently, the results obtained have been variable and at times contradictory.

With such historical background in mind, the authors have set the following objectives for the study:

1. To evaluate the action of Erythromycin, Vitamin A, and Bromhexine Hydrochloride on atrophic rhinitis.
2. To compare the clinical and histological responses of atrophic rhinitis to three different treatment regimens.
3. To provide data on atrophic rhinitis for further researches on this disease.

II. MATERIALS AND METHODS

Cases were selected as they were diagnosed at the ENT – Out Patient Department of the Philippine General Hospital over a period of six months. The criteria for selection were the following:

1. Presence of two or more of the triad of atrophic rhinitis:

   nasal crust
   foul odor
   atrophied turbinates

2. No previous history of nasal surgery, except for antrostomy
3. No previous medical treatment similar to the study received within the last 2 months.

The protocol was constructed to cover age, sex, occupation, duration of disease, chief complaints, past history, family history and physical examination. In the past history the use of nasal sprays and oral decongestants as well as surgical procedures and anatomical defects were investigated.

The patients were assigned at random into three groups with their corresponding medical treatment:

Group I:
1. Daily $NaHCO_3$ nasal irrigation 10 grams in one liter 500 ml. per nostril
2. Vitamin A
   a. Parenteral – 300,000 IU amp. intramuscularly on the deltoid muscle every three days for four doses.
   b. Oral – 2 tablets of 50,000 IU taken 3 times a day for
3. Bromhexine Hydrochloride (8 mg.) – Erythromycin 500 mg. combination tablet taken 2 times a day for 14 days.

Group II:
1. Daily $NaHCO_3$ nasal irrigation as in Grp. I
2. Vitamin A given in the same way as Grp. I
3. Erythromycin 500 mg. tablet taken 2 times a day for 14 days

Group III:
1. $NaHCO_3$ nasal irrigation as in Grp. I
2. Vitamin A administered in the same manner as in Group I.

After two weeks treatment, the patients continued with nasal irrigation for one month.

The Otolaryngologist who evaluated the clinical status of these patients was not informed of each patient's treatment to avoid biased evaluation.

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A biopsy of the middle portion of the inferior turbinate was taken before and after 2 weeks of treatment. The results of this will be the subject of another paper. *

There were 37 patients diagnosed to have atrophic rhinitis; 34 were females, 3 males. Only 27, all females, subjected themselves to treatment and study. The 3 males and 7 other females failed to come back or were irregular in their follow-up and intake of medication and, thus, they were excluded from further evaluation. There were 8 in Group I, II in Group II, and 8 in Group III.

The youngest patient was a 14 years old and the oldest were two 73 years old. The age distribution showed the majority of cases to be in the second to fourth decades of life.

The occupation was not significant since 80% of the patients were either housekeepers or housewives.

The duration of the disease was variable; most of the patients, however, have had their disease for 3-6 years.

With regard to past history, family history, associated surgical procedures, and anatomical defects, no significant correlation was found.

III. EVALUATION OF RESULTS

For decades, atrophic rhinitis has been treated with various medical modalities with different results. Surgical modalities will not be discussed since it is not within the scope of this paper.

For years sodium bicarbonate has been used as a basic treatment modality in the Philippine General Hospital. The favorable results obtained were attributed to the mechanical cleansing action and regulation of the nasal mucosa. These facts, however, have not fully been substantiated.

Vitamin A has been used by Strandbygard in the treatment of atrophic rhinitis with good results. This paper has adopted Strandbygard's manner of Vitamin A administration. The pharmacological action probably consists of activation of an impaired function of nucous epithelium and perhaps, also of the previously not considered effect upon the vegetative nervous system. [2]

Bromhexine hydrochloride-Erythromycin combination was used on the premise that atrophic rhinitis may be secondary to a chronic sinusitis. In a study of the treatment of sinusitis by Reyes, Jamir, et al. (1977), Bisolvonat has gained good results. The capability of bromhexine hydrochloride to reduce viscosity of nasal and bronchial secretions by fragmenting acid mucopolysaccharide fibres[4] was another reason.

Erythromycin have been included to countercheck the efficacy of bromhexine HCl-Erythromycin combination. Erythromycin was the antibiotic chosen to exclude the possibility of allergic reactions by other penicillin-based antibiotic with eventual aborted treatment.

The patients were evaluated on three periods: 1. Initial 2. 2 weeks after treatment, 3. one month after treatment.

With regard to chief complaints and physical examination, all patients presented with nasal crusting and atrophied turbinates. Almost all presented with headache, loss of smell, dry nasal mucosa, and mucopurulent discharge. A few presented with halithosis and dry or sore throat. Very few, only 5 patients, presented with postnasal drip.

In the evaluation of the results of treatment, it appears that Group I (Bromhexine HCl-Erythromycin combination) had higher percentage disappearance of symptoms than Group II and Group III, which presented with the lowest percentage. The percentage disappearance of symtoms of the groups are enumerated below:

	after 2 wks. treatment	one mo after
Group I	85%	90%
II	80%	85%
III	65%	72%

The % disappearance of symptoms was calculated in this manner;

$$\% = \frac{\text{Total no. of C.C. \& P.E. (After 2 wks. or 1 mo.) X 100}}{\text{Total no. of C.C. \& P. E. initially}}$$

The difference between Group I and Group II was not significant, but the difference between Group I and Group III was significant. We can just presume that the antibiotic played a major role and that bromhexine HCl may have made the small difference between Group I and II.

It also appears that patients in all groups were improving one month after treatment with sodium bicarbonate nasal irrigation alone. By this, we may just presume that with an initial loading dose of bromhexine HCl, erythromycin, and Vitamin A, the patient is set off for improvement or a longer period of treatment may have been more beneficial.

IV. LIMITATIONS OF THE STUDY

1. Scarcity of cases
2. Limited duration of treatment
3. Irregular follow-up of the patients, es-

pecially after one month.

V. CONCLUSIONS:

In a study of 27 cases of atrophic rhinitis at the ENT Out Patient Department of the Philippine General Hospital over a period of 6 months, the following assumptions are presented:

1. There is a preponderance of females in the study which lends support to the hormonal theory.
2. Clinically, it appears that the combination of bromhexine HCl and erythromycin gives better percentage on the disappearance of symptoms and improvement of P.E. findings than the other groups.
3. Clinically, it also appears that patients in all groups showed improvement after one month from start of treatment, which implies that a longer treatment period may give better results.

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ATROPHIC RHINITIS: Histology and Histological Response to Treatment

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Brendan R. Ferrolino, M.D.**

–INTRODUCTION–

Atrophic rhinitis is a chronic nasal disease first described by Fraenkel in 1876 and is characterized by progressive atrophy of the mucosa and underlying bone of the conchae. Microscopically, there is metaplasia of the pseudostratified columnar ciliated epithelium to a stratified squamous variety. Clinically the mucous membrane exudes a thick viscid secretion which dries up rapidly and forms crusts with a characteristic foul odor. Thus, the triad of symptoms of foul odor, atrophy of nasal mucosa and crust formation.

–Objectives–

The objectives of this study are to demonstrate the various histologic changes in atrophic rhinitis and to evaluate the microscopic response of the nasal mucosa to treatment with Erythromycin, Bromhexin, Vitamin A and $NaHCO_3$ irrigation. For the past several years, the Department of Otorhinolaryngology, UP-PGH Medical Center has employed this treatment regimen for cases of Atrophic Rhinitis on an empirical basis. We thought one should have an objective basis for such treatment.

–Methodology and Materials –

A series of 22 patients with clinical diagnosis of atrophic rhinitis in the previous study by Dr. B. Cruz, et al. were subjected to punch biopsy under local anesthesia of the inferior turbinate before and after treatment. These were stained with Haematoxylin and Eosin stain.

Pre and post treatment slides were read, tabulated and compared by the authors using the following parameters:

1. type of epithelium present
2. quality and relative number of mucous and serous glands
3. presence of mucous blanket
4. presence of inflammatory cells

To avoid bias on the part of the slide reader as far as the results are concerned, the slides were read at randon and the kind of treatment received by the patients were not known.
on whether the treatment is continued or aborted. The inflammatory cells originally moderate to many in pre-treatment slides decreased in 13 patients or 59%. No change was seen in 9 patients or 41%. A significant change was also noted as to the relative number and appearance of the mucous and serous glands. They were now bigger with larger foamy cytoplasm as was noted in 13 patients or 59%. There was no changed noted in 7 patients. As to the presence of the mucous blanket 14 patients 64% showed good response and 7 patients showed no response.

Utilizing the same parameters, we now consider the histologic response of the patients and correlate it with the treatment regimen received by the patients. Of the six patients who received Treatment A which consisted of Erythrocin, Bromhexin, Vitamin A and $NaHCO_3$ irrigation, five had good response as far as epithelium change is concerned, 50% with regards to the mucous gland, 4 out of 6 had mucous blanket and only one showed decrease in inflammatory cells.

Without the Bromhexin in Treatment B, six out of 9 showed reversion of epithelium, 8 had good response of the glands, 7 had decrease in inflammatory cells as well as the appearance of mucous blanket.

With Treatment C consisting only of Vitamin A and $NaHCO_3$ irrigation. The overall response rate of the patients in all the parameters were around 50%.

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In the pre-treatment slides, the following were noted. Twenty out of twenty-two patients showed stratified squamous type of epithelium. Only two patients differed and showed cuboidal columnar type of epithelium. As far as the presence of inflammatory cells were concerned, all except one showed many to moderate number of inflammatory cells. The mucous secreting glands in pretreatmert patients showed mostly few to none. If ever they are present, it was usually small with scanty cytoplasm. The so called "mucous blanket" that covers the normal epithelium of the nasal mucosa was also not present except in one.

It is obvious from the above results that the histologic hallmarks of atrophic rhihitis are very well documented. They are:

1. change of the normal pseudostratified columnar nasal epithelium to the stratified squamous variety,
2. decrease in the number and change in the quality of the compound mucous and serous secreting glands,
3. presence of inflammatory cells in the tunica propia,
4. loss of the normal mucosal blanket which is concomittant of the loss of the ciliated pseudostratified columnar epithelium.

In a histopathologic study by Taylor and Young on atrophic rhinitis, the following were noted as the characteristic histologic features:

1. presence of stratified and squamous epithelium
2. dilatation of capillaries
3. decrease in the number and size of the compound alveolar glands.

In addition to the above, El Barbary, et al. in a similar study also noted the following:

1. inflammatory cellular infiltration of the tunica propia mainly by lymphocytes and plasma cells.
2. excessive fibrosis of tunica propia in advanced cases.
3. marked endarteritis of the media together with the thickening of the media.

With these histologic features in mind we now proceed with the results of the treatment instituted on the same patients using the parameters mentioned. There was significant reversion of the epithelium, that is from the squamous variety to the pseudostratified columnar type noted in 12 patients or 55% and to the cuboidal type in six patients. No change was noted in only 4 patients. This change to cuboidal epithelium we interpret as a transitional change which would eventually become pseudostratified columnar epithelium or revert back to the squamous epithelium depending

–CONCLUSION–

The various histologic features of atrophic rhinitis has been presented. This is in agreement with previous investigators, that there is a change of the normal pseudostratified columnar epithelium to the squamous variety, the serous and mucous secreting glands show decrease in number with scanty cytoplasm, presence of inflammatory cells in the tunica propia and loss of the mucous blanket.

The overall treatment results shows a good histologic response irrespective of the treatment regimen instituted on the patients. In as much as treatment period was only for 2 weeks, perhaps with more prolonged treatment even with just Vitamin A & $NaHCO_3$ irrigation, better results could be attained in individuals patients. Furthermore, the addition of antibiotics in the therapy greatly increased the response.

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END
OF
SYMPOSIUM
ON
ATROPHIC RHINITIS

THE DIAGNOSIS OF CHRONIC RHINITIS AMONG UP-PGH PATIENTS *

Dr. M. Caparas **
Dr. R. Zantua ***
Dr. F. de Guzman ***

In this study, chronic rhinitis is defined as a non-infectious condition characterized by intermittent or continuous nasal symptoms (i.e., nasal congestion, sneezing, rhinorrhea, and itching of the eyes nose and throat). The definition includes allergic forms of seasonal and perennial rhinitis as well as vasomotor rhinitis.

The aims of this research are:

1. To determine the usual clinical presentation of allergic rhinitis in contrast to vasomotor rhinitis.
2. To establish a practical method of diagnosing allergic rhinitis.
3. To determine the common allergens involved in allergic rhinitis among UP-PGH patients using the skin test.

METHODS AND MATERIALS:

Patients seen at the Out Patient Section of the Department of Otorhinolaryngology, Philippine General Hospital, complaining of chronic rhinitis were categorized for allergological investigation from January, 1979 to October, 1979. All these patients underwent routine ENT examination and a detailed clinical history for allergic rhinitis. Excluded from the study were patients with atrophic rhinitis, patients with multiple symptoms other than those defined above, and patients with intestinal parasitism (as will be explained later).

Four allergological tests were used among the patients included in this study; namely, skin test, Blood Eosinophil count, Nasal Smear Cytology, and Airway Resistance Measurement. Provocation test was attempted, but because of the impracticality of testing all the allergens one at a time for each patient and the inavailability of a fixed volume of allergen extract of increasing concentration, this test was abandoned.

* First Prize – P.S.O. & B. Residents' Night, Nov. 1979

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METHOD FOR CASE HISTORY:

The case history was scored positive if the environmental factor responsible for the patient's symptoms was elicited or implicated. It was considered doubtful if infection or systemic diseases are likewise implicated to be the probable cause of the patient's symptoms. It was scored negative if no allergen is implicated to be responsible for the patient's symptoms. Only those cases labelled as positive were included in this study for further investigation.

METHOD FOR SKIN TEST:

This test was performed according to the routines of the Allergy Section, Medical Research Laboratory, PGH. In all these cases, intracutaneous test on the patient's bilateral deltoid area with injection of 0.02 ml. of 10^{-3} dilution (w/v) extracts were used. The extracts consisted of grass and tree pollens, animal danders, molds and kapoks. The reactions were recorded after 15 to 20 minutes and graded positive or negative according to the size of the weal compared to the control histamine and phosphate buffered solution.

METHOD FOR BLOOD EOSINOPHIL COUNT:

CBC and fecalysis were done on all patients included in this study. Those with intestinal parasitism were excluded. This test was considered positive if the Eosinophil count is more than 4% of the total WBC count.

METHOD FOR THE MEASUREMENT OF AIRWAY RESISTANCE

Nasal Airway resistance was measured using the formula: $\frac{\text{Pressure}}{\text{Flow (Volume/time)}}$ = – Pressure was measured with a manometer, while flow was computed from the graph taken using an oscilloscope A standard was first established using normal subjects (18 medical students). A significant statistical difference between the two groups (i.e., standard and patient groups) was computed and

confirmed using the t-test. The normal value for this test used was the mean of the standard group (0.09)

METHOD FOR NASAL CYTOLOGY:

A modification of the Andrew Murray and Donald Anderson method was adapted in this study. Using a cotton pledget, the inferior meatus and the inferior turbinates were swabbed and transferred to a glass slide. Wright's stain was used and the specimen was acanned under low power. Where eosinophils were in maximum concentration, they were counted under oil immersion. Considered positive were those with 10 or more Eosinophils in any 2 separate high power fields.

STATISTICAL METHOD AND CALCULATION

Data for the diagnostic parameters used were submitted to the Dept. of Biostatistics, Institute of Public Health, University of the Philippines System. Results were quantified into those with positive and negative reports. Using skin test as the standard, Case History, Blood Eosinophil Count, Nasal Smear Cytology and Airway Resistance measurement were statistically correlated. The methods used were t-test, z-test, chi square test and the sensitivity-specificity formula by Eriksson.

RESULTS:

Based on symptomatology and physical examination, our data showed that clinical differentiation between vasomotor rhinitis and allergic rhinitis was not possible. Nonetheless, the most common symptoms were: watery nasal discharge, nasal congestion, sneezing, post-nasal drip, and itchiness of the nose, throat, and eyes. On examination, the more common presentations were: boggy, blanched inferior turbinates, watery nasal discharge, long and silky eyelashes, hyperemia of the pharyngeal mucosa.

Diagnostic precision of the five allergological parameters mentioned were computed. Results showed high sensitivity and specificity values for Skin Test. Because of this, statistical correlation were done using skin test as the standard. Case History has a high sensitivity but low specificity. On the other hand, nasal smear cytology showed low sensitivity but relatively high specificity. Blood Eosinophilia revealed moderate sensitivity and specificity. Airway resistance measurement depicted a high sensitivity but zero specificity.

COMPARISON BETWEEN SKIN TEST AND CLINICAL HISTORY

There was a high correlation of 71.93% between skin test and case history. Z-test has confirmed that the difference in the positive and negative results using this two procedures is statistically significant. Hence, using these two parameters will give 71.93% accuracy in the diagnosis of allergic rhinitis.

COMPARISON BETWEEN SKIN TEST AND BLOOD EOSINOPHILIA

A relatively good agreement of 42.5% was found between skin test and blood eosinophilia. The statistical correlation was confirmed with the chi square test. The low sensitivity noted could be explained by the finding of Neils Mygind that the smaller the shock organ, the less is the degree of the eosinophilia. Hence, a positive Eosinophilia should be considered significant, while a negative result means nothing.

COMPARISON BETWEEN SKIN TEST AND NASAL SMEAR CYTOLOGY TEST

Besides the poor agreement of 4% between the tests, no statistical correlation was shown by the Chi Square test. Such can be attributed to the methodology used in obtaining the specimen. A more accurate method could have been to let the patient blow unto a cellophane square, instead of using a cotton pledget, where eosinophils could adhere.

COMPARISON BETWEEN SKIN TEST NASAL AIRWAY RESISTANCE LEVELS:

A relatively high agreement of 87% between skin test and airway resistance levels was noted. However, the significance was less considering that the total patients tested were only 23 out of the 41 patients with positive skin test. Also, the standard on which the normal value was taken consisted only of 18 subjects. Nonetheless, the data presented showed the significance of the role of nasal airway resistance measurement in the diagnosis of the allergic rhinitis.

Based on these comparisons and Sensitivity-Specificity computations, one conclusion is evident: Case history and Skin Test combined is the more practical and more accurate method for the diagnosis of allergic rhinitis. The other tests investigated can be used as ancillary procedures when doubt in the diagnosis arises despite the skin test result.

Concerning the third objective of this study, the common allergens identified as the causative factors in allergic rhinitis are mostly trees and grass. Animal danders, kapok, and feathers, which can be readily eliminated from the environment are less common among the 41 patients with posi-

tive skin test. The implication of this finding is significant as far as management of allergic rhinitis is concerned; that is, avoidance of the allergen will play a minor role compared to hypo- or desensitization in the treatment of allergic rhinitis.

Quoting from J. Sisson in his "Clinical Decision Analysis." " . . . knowledge acquired through an additional diagnostic test can do more harm than good to patients, if the consequences of employing the test are not analyzed."

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CONTRAST STUDIES IN FRONTAL AND ETHMOIDAL MUCOCELES *

by: Dr. M. Caparas, **
Dr. E. Cosalan ***
Dr. A. Pontejos, ***

Contrast studies have always been useful as a radiographic aid in delineating cavities, sinuses, tracts, and fistulae. The ability of contrast material to reach the cavities and delineate their configuration on x-ray has provided doctors with much needed information and has helped them in planning out the management of their patients.

In this study, we have explored the possibility of using contrast material as a diagnostic tool in frontal and ethmoidal mucoceles.

Definition:

A mucocele is an accumulation of mucoid secretion and desquamated epithelium within the sinus with distention of its wall occuring when the communication between the sinus and the nose is obstructed. Most of these mucoceles occur in the frontal and maxillary sinuses but may also occur in the ethmoidal and sphenoidal sinuses.

Patients with frontal and ethmoidal mucoceles usually present with a history of a slowly growing mass in the forehead or the medial canthus with other associated signs and symptoms like nasal obstruction, painless proptosis of long duration, headaches, diplopia, eye pain, and increased lacrimation. The mucocele expands in the direction of least resistance. In the frontal sinus, this is usually towards the floor of the sinus. In the ethmoidal sinus, expansion is usually through the lamina papyracea. These result in a lateral and downward displacement of the orbital contents resulting in proptosis and diplopia.

Further diagnosis and delineation of the mass is aided by the use of plain film and at times tomography. On plain film, the involved sinus would show expansion with rounding off the walls and at times areas of bony erosion. A tomogram on the other hand is sometimes requested to better evaluate the areas with bony erosions or even fractures. Of course, we cannot over emphasize the value of these diagnostic aids. Plain films however sometimes do not help us that much in delineating the mucocele especially in ethmoidal sinus films where there are other bones superimposed. A tomogram on the other hand, may be too expensive and unavailable for the primary patients we often meet in the clinics.

Objective:

The objective of the study is to develop a diagnostic procedure for frontal and ethmoidal mucoceles which is simple, economical and yet highly informative.

METHODOLOGY:

Eight cases of frontal and ethmoidal mucoceles were seen from 1978-1980, a period of three years and admitted to our ward. Of these, 2 were frontal mucoceles, 4 were ethmoidal mucoceles, and the other two were fronto-ethmoidal mucoceles. Contrast studies were done and the results evaluated. These patients were diagnosed on the characteristic history and physical examination which included initial x-rays of the paranasal sinuses.

The following are the materials used. They are minimal and readily available: 1) Lipiodol ultra fluid, 2) a large bore needle, gauge 14 or 16, 3) a 20 cc syringe, 4) a mosquito clamp and 5) sterile vials.

The procedure itself is simple: (We used here a model to demonstrate the procedure.)

1) Scout films (Caldwell and lateral views to evaluate the frontal and ethmoid sinuses) are first taken.

2) The area to be injected is then wiped with antiseptic solution.

3) Using a gauge 14 or 16 large bore needle, the mucocele is aspirated to the point where nothing more could be aspirated.

4) The needle is clamped at its point of entry to insure against accidentally pushing it deeper than is necessary. The aspirate is then sent for culture and sensitivity studies, cytology or gram staining.

* First Prize, P.S.O. & B. Residents' Night, Dec. 4, 1980

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Fig. 1 Shows a patient with proptosis and displacement of the eyeball to the right.

Fig. 2

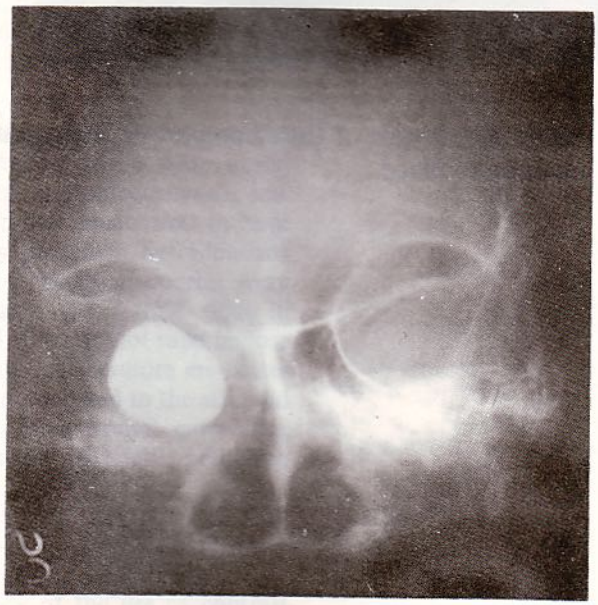

Fig. 2 Shows the same patient after all contents of the ethmoidal mucocele has been aspirated and then replaced with the same amount of contrast medium – (Caldwell's projection)

Fig. 3

Fig. 3 Right lateral view of the same patient with contrast medium in place.

5) Lipiodol ultra fluid is then injected, the amount being equal to what has been aspirated.

6) The needle is then withdrawn and post injection films (Caldwell and lateral views) are then taken.

RESULTS AND DISCUSSION

Contrast studies for frontal and ethmoidal sinus mucoceles are found to be very informative. The opacification of the contrast material on x-ray clearly defined the borders and configuration of the mucocele. We listed down the following advantages: 1) It provides us with a 3 dimensional view of the mucocele giving us a more graphic idea of the mucocele's extent and configuration with a minimum of x-ray plates. 2) It is easy to read and interpret. 3) The procedure itself is simple, inexpensive, and yet highly informative as compared to a tomogram, and 4) The pre-injection aspirate is in itself, of diagnostic value as it gives us an idea of the content of the mass. This may also be sent for gram staining, cytology, or culture and sensitivity studies.

Possible complications like breaking into the anterior cranial fossa, allergic reactions, and infections, were fortunately not encountered. In fact, no major problems were met. Two minor problems however presented themselves. These were a) underfilling of the mucocele with the contrast material giving us a false configuration of the mucocele. and, b) accidentally injecting the material subcutaneously. Both however could have been avoided with more meticulous attention to technique.

Despite such encouraging results, the study has its limitations. We found it to be more useful in ethmoidal mucoceles, in fronloethmoidal mucoceles and in small frontal mucoceles. In large frontal mucoceles, they proved to be redundant as plain x-ray views of these mucoceles were sufficient. This is because the frontal sinus in the Caldwell and lateral views do not superimpose on other bony structures and therefore are better identified and defined as compared to the ethmoid sinuses. Moreover, with large frontal mucoceles, a greater volume of contrast material is needed to fill up the cavity.

CONCLUSION:

From our initial study of the use of contrast material in eight cases of frontal and ethmoidal mucoceles, our conclusion is that whether as an adjunct procedure or as a single procedure, contrast studies of frontal and ethmoidal mucoceles is highly informative diagnostic procedure.

Its graphic presentation of the lesion gives us a direct and clear idea of the mucocele's extent and configuration.

Its value is even more so when we take into consideration the availability of the materials used, its relative economy, and the simplicity of the procedured.

TRANSLABYRINTHINE APPROACH TO ACOUSTIC TUMORS

by: Carlos P. Reyes, M.D.*

INTRODUCTION:

For many years the diagnosis of Acoustic Tumors seems to have escaped detection by Otolaryngologists. Frequently these tumors when diagnosed, have become mature and large enough in size to cause irritation and compression of the cerebello-pontine angle. When vertigo, hearing loss, tinnitus present with localizing signs of ataxia, headaches and nerve deficits, then this diagnosis is considered. It is an accepted fact that traditional surgery by the suboccipital approach is attended by increased morbidity and mortality which are undesirable but unavoidable.

The early detection of small acoustic tumors by Otolaryngologists is the subject of another paper. This paper will outline the surgical procedure done by the author on a patient last Oct. 22, 1980.

Indications

The translabyrinthine route to the internal acoustic meatus is but one of several approaches now currently available to the Otolaryngologist for the removal of acoustic tumors. Other procedure include the Middle Fossa approach. Combined Suboccipital-Translabyrinthine approach. The Retrolabrynthine approach and the transcochlear approach.

The translabyrinthine approach is indicated in patients with a small to medium size intra canalicular tumor, little or no serviceable hearing, without evidence of increased intracranial pressure and no compression of the brainstem.

When the tumor is small and not exceeding 0.8 cm in diameter, good or serviceable hearing, and no compression of the cerebello-pontine angle, the Middle Cranial Fossa approach is preferred in order to preserve hearing.

When an acoustic tumor compresses the cerebello-pontine Angle, is 2.0 cm or larger in diameter and starts to produces localizing sign of ataxia, incoordination, or shows evidence of increasing intracranial pressure the translabyrinthine approach is combined with the suboccipital approach.

In cases where a meningioma is suspected and it is desireable to preserve useful hearing a retrolabyrinthine approach combined with the suboccipital route is preferrable.

In all cases preservation of facial nerve function should be sought for. case report (see next page)

Procedure;

The suitable patient undergoes general anesthesia and is positioned and prepared as for mastoidectomy. A post auricular incission extending from the tip of the mastoid process and extending about 2.0 cm beyond the Linea Temporalis is made. Before elevation of the periosteum the temporalis muscle is preserved, sectioned, and retracted away. A simple mastoidectomy is accomplished using cutting burs and continous suction-irrigation with normal saline. A thorough decorticatication and mastoid air cell exenteration should be accomplished and landmarks like the Sino-Dural angle well exposed. The facial nerve is identified and proximal to it the horizontal semi-circular canal. Using Diamond drills the semi-circular canals are exposed one after another. After exenterating the horizontal canal, the posterior canal emerges at an angle of 90 degrees and is followed superiourly to its common crura with the superior semi-circular canal. The superior canal is traced anteriourly to its ampulla and the vestibule entered. The superior vestibular nerve will emerge and serves as the gateway to the internal acoustic meatus. By further drilling away bone the anatomy of the internal canal becomes clearer and all nerves identified.

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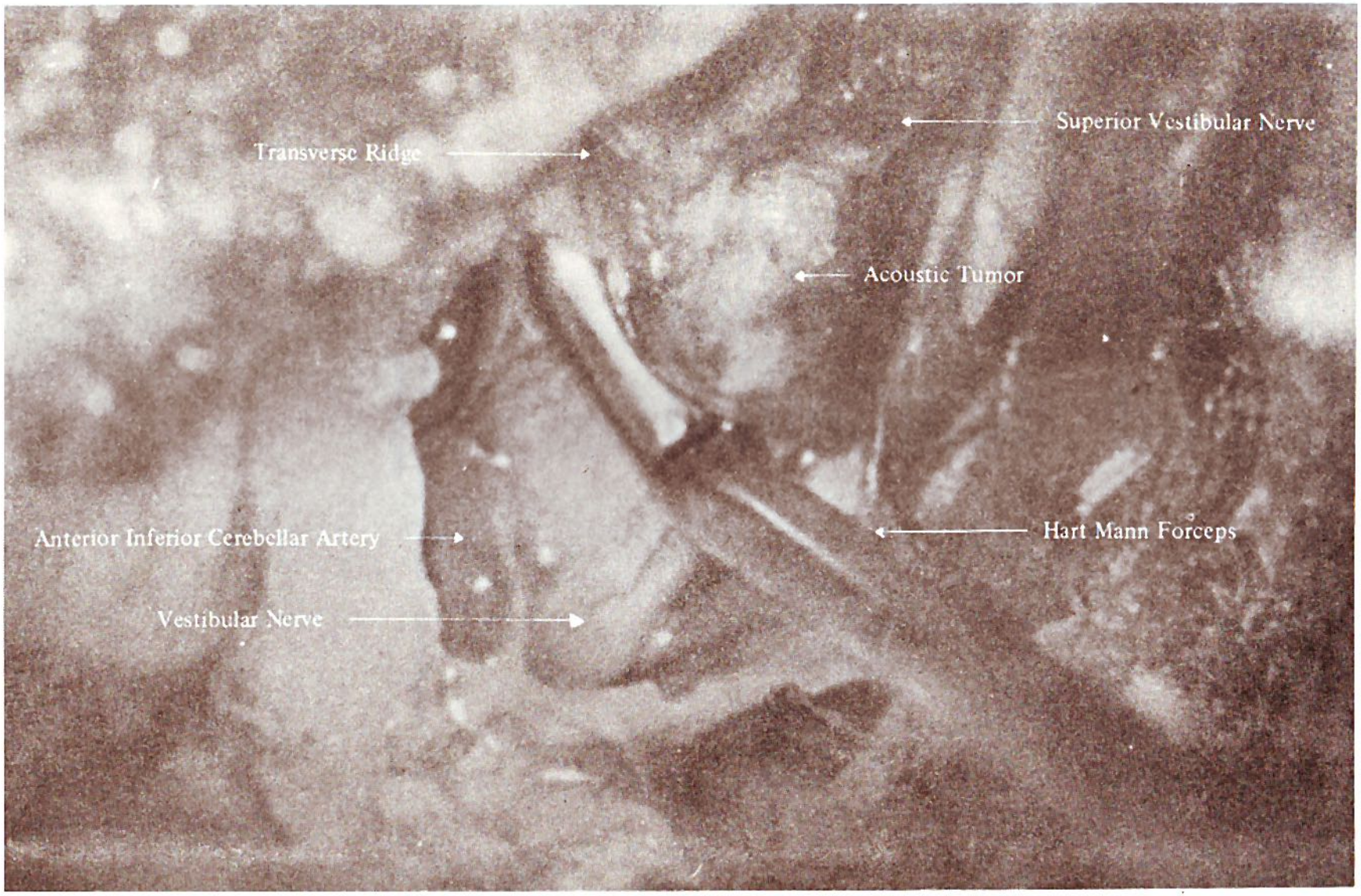

left ear This photo shows the acoustic tumor during the operation.

After identifying all nerves, the tumor is incised (majority of acoustic tumors are neuromas and these arise from the vestibular nerve) Using nerve hooks the tumor is severed from the distal and first, then the proximal segment. Hemostasis is maintained by Bi-polar coagulation. A thorough search for bleeders is performed before covering the acoustic canal with free Temporalis Muscle Graft. The mastoid cavity is packed with compressed Gelfoam and the incission closed in layers in the usual manner. A sterile mastoid dressing is applied.

Post-operative Course:

The patient stays in the recovery room for the first 24 hours. Vital signs as well as pupillary size and changes in sensorium monitored. IV Fluids are monitored throughout the period and vestibular suppresants are given. Should signs of increasing intracranial pressure become manifest the patient may be brought back to the operating room. The wound re-opened and the re-explored for intracranial bleeding. Otherwise the patient is transferred to his room. Antibiotics as well as analgesic are maintained. The patient remains recumbent until he is able to adopt to the influence of only one intact vestibular system. Oral feeding is introduced gradually. The patient remains hospitalized for about 10-14 days. He starts to mobilize and ambulate by the 5th to the 7th post operation day.

Editor's Notes: Time constraints precluded the inclusion of photographs.

THE EUSTACHIAN TUBE OPENING PRESSURE AS A CRITERION FOR TYMPANOPLASTY *

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At present, the section of Otology in the Department of ENT, U.P.-P.G.H. Medical Center has established the following pre-requisites for tympanoplasty: 1. Treated paranasal and nasal pathology, 2. Absence of active ear infection, 3. Presenting evidence of slight to moderately severe conductive component of hearing loss, 4. Persistence of perforation of the eardrum despite the absence of active infection in the affected ear, 5. Patch test shows improvement, 6. Patent eustachian tube.[1] Our paper concerns the last criterion: Patent Eustachian Tube.

The usual method of testing the eustachian patency presently employed is the politzerisation-catheterization method described by Shambaugh in 1959[2] and the stethoscope – hose method originally described by Urzendowsky[3] in 1968. With these methods, it is difficult to quantitate the various degrees of eustachian tube hypofunction. Also, increased air pressure in the nasopharynx may in effect, force its way through the orifice of a malfunctioning eustachian tube, producing a false positive result. Lastly, it is not a physiologic function test.[4] Other better alternatives are described in the literature like the Naunton, RF-Gelluser[5] technique, which employs an electronic system from the evaluation of eustachian tube function. Another method is the George Miller[6] test, especially adapted for patients with perforated tympanic membranes. This method utilizes a foley catheter and a polygraph machine for the evaluation of the eustachian tube function.

In search of a practical and a cheap alternative, we adopted a modified manometry test consisting of a T-tube attached to 3 ordinary rubber tubings. One end of the tube is attached to the manometer, another end is attached to an earpiece, and the third tube is connected to the handpiece of the manometer. When pressure is introduced from the handpiece, an equalised pressure system is achieved and qualified by the manometer. The eustachian tube opening pressure is marked by the sudden drop of the mercury level in the manometer. The patient is instructed not to swallow, yawn, or sneeze during the procedure to avoid opening of the eustachian tube. Using this technique, we devised a study with the following objectives:

1. to determine the effectivity of using the eustachian tube opening pressure as a prognostic criterion for tympanoplasty,

2. To standardize the eustachian tube opening pressure with a good prognosis of take in tympanoplasty,

3. To establish a cheap and practical test for evaluating the eustachian tube patency. Our research included all adult males and females who passed the six requirements for tympanoplasty enumerated at the beginning. For our purpose, the pre-operative work-up done included:

1. Pre-operative audiogram,
2. Patch test audiogram,
3. Eustachian tube opening pressure.

Follow-up findings were charted and one post-operative audiogram was done for each case.

Since April 1979, we were able to include six patients, two of whom were failures and four with good take. The eustachian tube opening pressure among the failures were: 55mm Hg. and 45mm. Hg., while those with good take were 35, 15, 15, and 10mm Hg. The mean length of time during which perforation or lateralization, which are our definition of failure, was 2½ months. Considering that other factors were involved in the good or poor take of tympanoplasty cases, may we present a tabulated summary of the individual cases:

Case 1 was the first of our two failures. She was 43 years old with a 75%, central perforation on the left tympanic membrane. The eustachian tube pressure in this case was 55mm Hg. Although the paranasal sinuses were normal during the time

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of surgery, the patient has been treated for maxillary sinusitis on the right in 1978 and on the left in 1979. The patch test showed 10-15 dB improvement. The post-op., audiogram showed 10-20 dB narrowing of the air-bone gap. Follow-up was done for 4 months, and on the third month, lateralization of the graft was noted. This was done by one of our consultants; and the technique, which is the basic technique in all our six cases, is the use of palva flap and the temporalis fascia graft. A silastic sheet was used in this case to support the graft. This was done under general anesthesia.

Case 2 was the second of our failures. He was 13 years old with 80% central perforation of the right tympanic membrane. The eustachian tube pressure was 45mm Hg. The paranasal sinuses were normal during surgery. The patch test showed 15-20 dB improvement. Although there was a 10 to 15 dB widening of the air-bone gap postoperatively, the air conduction improved by 15 to 25 dB. Follow-up in this case was done for 12 months and on the second month, lateralization of the flap was noted. On the fifth month perforation of the graft was seen. This was done by a senior resident with the same technique of palva flap and temporalis fascia graft except that a post-auricular incision was done. This case was done under G.A.

Case 3 was the first of our 4 good takes. The patient was a 20 year old female. with a 70% central perforation. The eustachian tube pressure was 35mm Hg. The paranasal sinuses were normal during the time of surgery, although the patient had a history of treated maxillary sinusitis one year before surgery. The patch test showed 15 to 20 dB improvement. The post-operative audiogram taken 6 months later showed 10 to 50 dB narrowing of the air-bone gap. This was done by a senior resident with the same technique of palva flap and temporalis fascia graft. Post-auricular incision was done in this case under local anesthesia.

Case 4 was the second of our good take. He was a 37 year old with a 60% central perforation. of the right tympanic membrane. His paranasal sinuses were normal on X-ray during the time of surgery, although he had a history of treated maxillary sinusitis 8 years prior to surgery. The patch test showed 10-15 dB improvement. His post-operative audiogram showed 5 to 10 dB narrowing of the air-bone gap. Follow-up was done for 4 months, and this was done by a senior resident. The same technique of palva flap and temporalis fascia graft was used. A post-auricular approach was done under local anesthesia.

Case 5 was the third of our good take. She was 38 years old with an 80%, central perforation of the left tympanic membrane. The eustachian tube pressure was 10mm Hg. The paranasal sinuses were normal during surgery, but the patient had a history of treated maxilarly sinusitis 4 months prior to surgery. The patch test showed 10 to 20 dB improvement. The post-operative audiogram showed a 5 to 10 dB narrowing of the air-bone gap at 2,000-8,000 hertz level. Follow-up was done for 6 months. The surgeon in this case was a senior resident, and the technique was the same temporalis fascia graft and palva flap. The approach done was post-auricular. The procedure was done under local anesthesia.

Case 6 was the fourth of our good take, and the patient was an 18 year old female with a right tympanic membrane perforation. The perforation was 80-90%, central. The paranasal sinuses was normal during the time of operation, although she had a history of maxillary sinusitis treated a month before surgery. Patch test showed 10-20 dB improvement, and the post-operative audiogram showed the same degree of improvement. Follow-up was done for 4 months. The surgeon in this case was a senior resident. The technique done was the same palva flap and temporalis fascia graft with a post-auricular approach.

DISCUSSION:

The eustachian tube has 2 important functions in tympanoplasty cases:

1. Ventilatory function – The eustachian tube protects the ear from large and rapid pressure changes and permits the middle ear pressure to equalise with the external air pressure.[5] In a hypofunctioning eustachian tube, negative pressure in the tympanic cavity increases due to the absorption primarily of oxygen by the middle ear mucosa.[6] Instead of normally opening up when pressure in the nasopharynx rose to 5cm. H20 (in 68% of cases)[7], the persistent negative pressure in the middle ear causes hydrops exvacuo.[5] This is described as retraction of the tympanic membrane, edema of the middle ear mucosa, and production of transudate causing lateralisation and perforation in tympanoplasty cases.
2. Drainage function – The mucus blanket of the eustachian tube is carried by ciliary movement directed towards the nasopharynx. In tympanoplasty cases, this is an important excretory function, other than the resorption function of the tympanic mucosa.[7]

When the normal eustachian tube opens, it begins from the middle ear end and then pro-

ceeds to the nasopharyngeal orifice. The normal value of pressure for tubal patency or the eustachian tube opening pressure, has been established by Paparella and Shumrick in 1973 as 20-30mm Hg.[5] In our cases, the range of eustachian tube opening pressure, with good take is 10 to 35mm Hg. Although 6 cases do not warrant statistical correlation, it can be assumed that up to 35mm Hg., the patient has better chances of take after tympanoplasty.

Our method can measure the eustachian tube opening pressure in patients with perforated tympanic membrane only with a positive pressure applied to the middle ear; unlike the impedance apparatus which measures the eustachian tube function both at a positive and a negative middle ear pressure. On the other hand, both methods are physiologic function tests because they quantitatively measure the airway resistance in the eustachian tube. Also, the application of a positive pressure in the middle ear simulates the opening of the eustachian tube into the nasopharynx.

Although the politzer bag still holds a distinct and useful place in otologic practice, the manometry method offers better advantages and can be adapted for bedside and office use.

CONCLUSIONS:

1. The use of manometry in evaluating eustachian tube patency accords the following advantages:
   a) It is a quantitative method of evaluation
   b) False positive results are minimized.
   c) It is a physiologic function test.
2. The standard eustachian tube opening pressure with good prognosis of take in tympanoplasty is less than or equal to 35mm Hg (Based on 6 cases).
3. The manometry method is a cheap and practical test of evaluating the eustachian tube patency short of an impedance audiometry.

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MYCOLOGY OF THE CERUMEN

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INTRODUCTION

Otomycosis, or otitis externa of fungal etiology has never held a prominent place among ear diseases. Most authors suggest that it occurs infrequently and that treatment is a simple matter of applying some well known preparation. (2). Focus was centered on this disease when Gregson and La Touche in 1961 were able to establish a high frequency of this type of infection (2). Subsequent studies by Yassin (10.12) confirmed that there was indeed a high incidence of otomycosis in the world.

This disease is a chronic or subacute infection of the pinna, the external auditory meatus, and the ear canal. Various fungi may be involved, along with several bacteria (3). Symptoms of the infection include scaling, itchiness, and pain. The canal is seen to be crusted, edematous, erythematous, and there is a collection of cerumen, A feeling of fullness of the ear is often present, along with impairment of hearing. Suppuration and a foul odor may also be found and are caused by bacterial invasion of the subepithelial layers. In cases where there is little bacterial involvement, the lesions are dry and eczematised. In 80 to 90% of cases of otitis externa, a variety of bacteria are found, including Pseudomonas, Proteus, Micrococcus, Streptococcus, Escherichia, and Corynebacterium (3). Most often, the condition responds to antibacterial therapy alone. A fungal etiology in such cases is doubtful, even if it is positive by culture. The establishment of a true fungal etiology for otitis externa requires: (1) demonstration of mycelial elements in scrapings, and (2) a positive culture (4).

Application of nystatin ointment for three to four weeks clears the infection in some cases of otomycosis. Phenylmercuric borate ointment has been used with good results in a series of cases. The treatment involves cleaning of the ear, removal of macerated debris, Burrow's solution, 5% aluminum acetate solution, or urea-acetic solution and in the debridement of ear material. More often than not, this is sufficient to effect cure. Antibacterial preparations used to combat secondary bacterial infections include chloramphenicol, bacitracin, polymyxin, neomycin, and aureomycin. Minimal bacterial infections could be treated with metacresol acetate, thymol in metacresyl acetate, and phenylmercuric acetate (0.02%) in water or as a borate ointment (0.005 and 0.04%) (3,9).

Fungal infections of the ear have long been recognized to be due to Aspergilli as mentioned by Capps and Fresincus (12). Wolf found that Aspergillus is responsible for about 90% of cases. Out of 3,000 general ear, nose, throat (E.N.T.) cases in Egypt, 171 (5.7%) cases were found to be due to fungus infections (12). In a study conducted in Saudi Arabia in 1975, 148 cases clinically suspected of being otomycotic were examined by culture and 120 gave positive results and yielded 131 fungal isolates (10).

Fungi infecting the ear are mainly airborne contaminants. Fungal spores and hyphae that contaminate the atmosphere are able to grow in the external auditory meatus and are able to induce infection. When in the meatus, the fungus thrives on the cerumen for nourishment. As in otomycosis, which is caused mainly by Aspergilli, cerumen constitutes the main essential nutrition for fungal growth (11). In evaluating the chemistry of the cerumen, Nakashima (11) found the following constituents: cerotic acid, cholesterol, hexone bases, neurostearic acid, decanoic acid derivative ($C_{17}H_{34}O_2$), and the amino acids: arginine, cystine, histidine, lysine, proline and tyrosine. Barr in 1953 has shown that in addition to the above mentioned amino acids, cerumen has the following free amino acids: leucine, isoleucine, valine, alanine, threonine, serine, glutamic acid, aspartic acid, glycine, and amino butyric acid (11). From the above constituents, it would seem that the cerumen is a consummate locus for fungal growth and nutrition. However, in a microchemical analysis of the cerumen by Yassin (11), it was established that the normal cerumen contains a mean concentration of 1.870 – 0.246 mg% of copper which is known to be toxic for fungi.

SIGNIFICANCE

Due to the high incidence of otomycotic infections of the ear, and the role the cerumen plays either as an enhancer or inhibitor of fungal growth, it is necessary to look into the mycotic flora of the normal and the pathologic (diseased) cerumen. A pilot study was done on this aspect by Santos (7) in 1978. This study serves to ex-

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pand and quantify that study.

OBJECTIVES

The objective of this study is to compare the normal and the pathologic mycotic flora of the cerumen. More specifically, this study aims

a) to monitor the degree of occurence of fungal structures in the cerumen of normal and diseased ears, and

b) to establish if there is any significant difference in the mycotic flora of the cerumen of normal and diseased ears.

MATERIALS AND METHODS

A. Subjects:

1. Fifty students from the Institute of Public Health with no apparent ear infections composed the normal subjects.
2. Forty patients referred to the Department of Otorhinolaryngology of the Philippine General Hospital with impacted cerumen composed the subjects with diseased ears.

B. Collection of Specimen:

1. Subjects with normal ears:
   Cerumen from these group of subjects were obtained with the aid of sterile toothpick. Collected specimen were placed in vials containing 1 ml sterile saline solution.
2. Subjects with diseased ears:
   Irrigation fluid, secretions and compact cerumen from patients were collected with the aid of sterile toothpick or the appropriate instrument. The specimens were placed in sterile vials.

Cerumen obtained from normal subjects were classified to either wet or dry.

C. Microscopic Examination of Specimen:

Specimen was mounted on potassium hydroxide with ink (KOH) and examined under the scope for fungal structures, e.g. hyphae, spores and other specialized structures.

D Culture:

Specimens were inoculated on Sabouraud's dextrose agar, and incubated at room temperature for 3-5 days. Colonies were characterized as to colonial and microscopic morphology. Identification was done to the genus level.

RESULTS AND DISCUSSION

Fifty individuals with no apparent ear infections and forty PGH patients with diseased ears served as the subjects for the comparative study of the mycotic flora of the cerumen. Because of the difficulty in the procurement of specimens from diseased ears, and the restricted time within which to accomplish this study, the original target of fifty specimens had to be reduced to forty; hence, accounting for the unequal distribution of subjects.

A great majority of the subjects with diseased ears presented themselves with impacted cerumen. This is a physiological abnormality since normally, the cerumen does not accumulate in the auditory meatus. Of the 40 subjects with diseased ears, only 1 was clinically diagnosed as otomycotic.

The results (microscopic and culture examination were categorized following the classification of Powell (5): if a fungus was found both by microscopy and in culture, the case was considered unequivocably positive; if the microscopic mount did not show any fungal structure, and the fungus was isolated in considerable quantity or vice versa, it was classified as probably positive; and if the microscopy and culture did not show the presence of any fungal structure or isolate, the case was considered as negative. In determining the statistical significance of the results obtained from the normal and the diseased ears, the Chi-square test (X^2) and the z-test were employed.

Table I presents the result of the above classification.

From the data, it would seem ironic that normal ear conditions should present a higher percentage with mycotic flora than the diseased ears. However, in subjecting the results to statistical analysis using the Chi-square (X^2) test, it was established that there is no significant difference in the mycotic flora of the two ear conditions.

Further evaluation using the z-test was employed to determine correlation between cerumen from the normal and diseased ears in each category. Computations again showed that there is no significant difference in the ear conditions of the unequivocably positive as well as the negative and probably positive categories.

Table I Classification of the Mycotic Flora of the Cerumen of Normal and Diseased Ears

Category	Ear Condition		Total
	Normal	Diseased	
unequivocably positive	16 (32.00%)	10 (25.00%)	26 (28.88%)
probably positive	24 (48.00%)	17 (42.50%)	41 (45.55%)
negative	10 (20.00%)	13 (32.50%)	23 (25.55%)
Total	50	40	90

In expounding the rationale on the greater ratio of fungal structures in the normal over the diseased ear condition, the following explanations are hereby given: first, since fungus spores abound in the atmosphere, and enter the meatus only to lie dormant there, their detection by microscopy and culture could not be regarded as evidence that they were playing an active role in an infective process therein; secondly, the greater ratio of mycotic flora found in the normal cerumen may be attributed to chance variation in the random sampling of the subjects, as attested by the computations which showed no significant difference in the mycotic flora of the cerumen of the two ear conditions; a third factor lies on the fact that since the bulk of specimens from the diseased ear conditions were largely impacted cerumen that had not been clinically diagnosed as otomycotic, there is no assurance that the pathology is of fungal etiology.

Of the twenty-four (24) probably positive positive specimens from normal ears, thirteen (13) yielded positive microscopy results and negative culture while eleven (11) showed negative microscopic mounts and positive culture. For the diseased series under this category, all the seventeen (17) probably positive specimens showed positive microscopy but negative culture. In the former condition wherein there is a positive microscopic result but negative culture, such a predicament could have occured owing to the death of the fungus due to the toxic action of copper which is a normal constituent of the cerumen (11). This could account for the presence of the negative cultures. Since, however, fungal organisms do not possess autolytic enzymes, the demonstration of fungal structures microscopically is therefore expected. For the second condition wherein the microscopy is negative but the culture showed fungal structures, the probability of catching the fungal structures on the microscopic mount in the presence of minimal fungal organisms is lower than in culture. This can be attributed to the unequal dispersion of the organisms in the specimen; hence, presenting a negative microscopic picture with a positive culture results.

In Table II, the different species of fungi isolated in both the diseased and normal cerumen is presented.

Of the 50 normal subjects examined by culture and microscopy, 20 (40%) gave positive cultures. From these positive cultures, the yeast form was isolated in 8 isolates (16.00%), Penicillum sp. 4 (8.00%), Paecilomyces sp. in 4 (8.00%), and Mycelia sterila, Hormodendrum sp., Pleospora sp., and Monilia sitophila were each isolated once (2.00%).

Table II Number & Percentage of Different Fungi Isolated in the Cerumen of Normal and Diseased Ears

ISOLATE	EAR CONDITION	
	Normal	Diseased
Penicillum sp	4 (8.00%)	1 (2.50%)
Mycelia sterila	1 (2.00%)	–
Monilia sitophila	1 (2.00%)	–
Hormodendrum	1 (2.00%)	–
Pleospora sp.	1 (2.00%)	–
Paecilomyces sp.	4 (8.00%)	4 (10.00%)
Yeast	8 (16.00%)	–
Aspergillus sp.	–	11 (27.50%)
a) Aspergillus flavus-oryzae	–	5 (12.50%)
b) Other Aspergillus sp.	–	6 (15.00%)
T O T A L	20 (40.00%)	16 (40.00%)

For the diseased subjects, the fungi found were predominantly species of Aspergillus (27.50%) with the Aspergillus flavus-oryzae group occupying 15.00%). Likewise isolated was the Paecilomyces sp. which constituted (10.00%) of the total isolates, and the Penicillum sp. which was isolated once (2.50%).

In assessing the results, it is observed that all the isolates in both the normal and the diseased cerumen are normal, air-borne fungal contaminants. It does not require experimental proof to show that the percentage relative humidity in the external auditory meatus is high, particularly when otitis externa is present, nor that the temperature in this site closely approximates "body temperature". Epithelial debris and serous exudate in various stages of chemical breakdown also provide a nutrient which is apparently suitable for molds and yeasts to become established in the auditory meatus. Such conditions should be, it might seem, suitable for many molds and yeasts even if not the best for particular species. Yet the fact remains that a particular group of molds, namely certain species of Aspergillus, and yeast fungi are predominantly favored in these circumstances. To explain this, certain selective factors have been postulated by Gregson and La Touche. (2) First of all, there is the factor of high temperature. All the species of Aspergillus whose active presence in the external auditory meatus was established microscopically and culturally have been found subsequently to be able to grow and reproduce more rapidly at 37 C than at 27 C, as judged by naked-eye observation within the first 24 hours following inoculation of culture slopes with a standard loopful of spore suspension. Another selective factor may be the ability of some of these species to produce antibiotics which enable them to establish themselves in competition with the bacteria which are almost invariably associated with them in otitis externa. Lastly, the fungi found in the body is reflective of the mycotic flora of the environment. In a study on the aeromycology of Metro Manila by Reyes and Punsalang in 1968-1969, (6) it was established that the predominant fungi found in Metro Manila is indeed Aspergillus sp.

In the diseased ear condition, the male to female ratio was 1:1. The ages ranged from 3½ years to 67 years of age with the highest incidence between the 25-44 age group, indicating therefore that differences in age and sex are not statistically significant.

A consideration of the metabolism of the fungi indicates that moisture or humidity is one of the factors essential for fungal proliferation. An appraisal therefore of the condition or type of cerumen, as to wet or dry, was done on the normal subjects, utilizing again both the Chi-square (X^2) test and the z-test. All computations pointed towards the fact that there was no statistically significant difference between the wet and dry cerumen of the normal subjects. In Table III, the greater ratio of fungal growth in dry cerumen inspite of the basic necessity of moisture for fungal proliferation could again be attributed to chance variation in the random sampling of the subjects.

No similar evaluation could be done on the cerumen of the diseased ears due to the inability to classify the state. To acquire the specimen in such ear conditions, the auditory meatus is irrigated with distilled saline solution, thereby precluding any possibility of identifying its factual condition.

Table III Classification of the Mycotic Flora found in the Dry and Wet Cerumen of Normal Ear Conditions

Category	Type of Cerumen		Total
	Wet	Dry	
unequivocably positive	6 (12.00%)	9 (18.00%)	15 (30.00%)
probably positive	15 (30.00%)	9 (18.00%)	24 (48.00%)
negative	8 (16.00%)	3 (6.00%)	11 (22.00%)
Total	29 (58.00%)	21 (42.00%)	50

LIMITATIONS OF THE STUDY

As in any study, there were limitations that beset this endeavor. These restraints include the following:

1) The fungi causing ear infections are common contaminants found in the laboratory, thus the origin of a contaminant supposedly isolated from the cerumen could be open to question.
2) Difficulty in the procurement of cerumen from diseased ears from the Out-Patient Department of the Philippine General Hospital.
3) Inexperience of the investigator to speciate the fungi isolated.

These limitations should therefore be considered in the interpretation of the results of this study.

SUMMARY & CONCLUSION

To recapitulate, microscopic and cultural ana-

lysis of cerumen obtained from 50 normal and 40 diseased ear conditions was carried out to determine any significant difference in its mycotic flora. In addition, an appraisal of the type of cerumen, as to wet or dry was done on the normal subjects.

Statistical analysis of the microscopic and cultural examination results of the cerumen showed that

CONCLUSIONS:

i) there is no significant difference in the mycotic flora of the cerumen from diseased and normal ears

ii) the type of cerumen, i.e., wet or dry, does not significantly affect the mycotic flora of the cerumen from normal ears, and

iii) there is no significant difference in the mycotic flora of the cerumen from both sexes as well as the different age groups.

The predominant fungi found in the normal cerumen were the Yeasts, while the Aspergillus flavus-oryzae group was most common in cerumen from diseased ears.

It is not claimed that this paper has provided any great significant scientific advancement in the study of the mycotic flora of the normal and diseased cerumen.

The investigator is only too well aware of the many variables and limitations that are contained in this work. Nevertheless, this does seem to be a field worthy of further investigation.

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ANTIMICROBIALS IN UNCOMPLICATED TYMPANOMASTOIDITIS

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INTRODUCTION

The advent of newer and more potent antibiotics has brought a new era in the management of infections. Ironically, however, the incidence of tympanomastoiditis has surprisingly remained high. Of the 4,924 cases seen at the OPD-Ear, Nose and Throat clinic in a two-year span from June 1, 1978 to May 31, 1980, 984 or 19.98% were cases of tympanomastoiditis. (see Table I)

Table I
ENT Cases seen at the OPD-Otolaryngology
Hospital ng Maynila
June 11 1978 to May 31, 1980

Total No. of Cases	Tympanomastoiditis Cases	Surgical Cases
4,924	984 (19.98%)	79 (8.02%)

Not only do we see many of this disease entity but a great number of them are with complications. (see Table II)

Table II
Ward Admissions
June 1, 1978 to May 31, 1980

Total No. of Ear Cases	–	107
Tympanomastoiditis with cholesteatoma	–	79
Additional Complications		
– labyrinthitis	–	2
– meningitis	–	7
– brain abscess	–	2

Case Report

M.F., 15 years old female was admitted at Hospital ng Maynila on October 7, 1980 complaining of dizzy spells.

Patient had a chronically discharging right ear since early childhood. Discharge is foul, yellowish. mucopurulent, usually exacerbated by and upper respiratory tract infection. The several general practitioners consulted gave different medications, mostly antibiotic (penicillins, tetracyclines, aminoglycosides, etc.) to no avail. Two years ago she was confined at Siquijor Provincial Hospital because of high temperature with associated swelling at the post-auricular area. She was discharged without the benefit of any surgical intervention. Two days prior to admission she had a whirling sensation accompanied by episodes of vomiting and a drop in hearing acuity of the right ear.

On admission, patient was conscious, coherent, with essentially normal vital signs. A draining fistula was noted behind the right ear. Pupils were equal reacting to light with essentially normal fundoscopic findings, Otoscopic examination revealed a normal left ear and a draining right ear with purulent, foul-smelling discharge. The tympanic membrane is completely gone. No ossicles could be seen.

Coordination tests, including Romberg's were within limits of normal. No spontaneous nystag-

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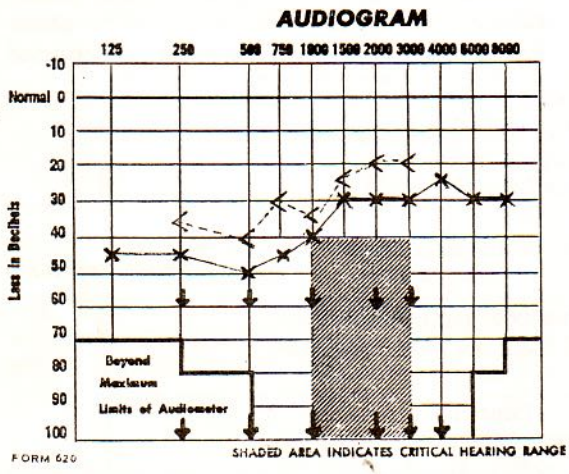
mus was noted. No motor deficit was elicited.

Pure tone audiometry revealed profound hearing loss of right ear. Patient underwent radical mastoidectomy a week following admission. On opening up, cholesteatoma was noted to occupy the enlarged mastoid antrum and the middle ear. The posterior bony canal wall was noted to have been eaten up by cholesteatoma. This, including the matrix, was removed and the mastoid antrum exteriorized. No gross communications into the labyrinth was discerned. This youngster was discharged on October 25, 1980 improved. Hearing remained depressed but she was no longer having dizzy spells.

Pure Tone Audiometry



DISCUSSION

The case presented obviously is a story of failure – a failure at conservative management and the story poses several interesting questions. Of the several questions however, a few are better left unasked as the history is bare and meager of several pertinent informations.

The one question that could not be disregarded as this would have much bearing with the ultimate selection of an appropriate drug singly or in combination is – Has there been an attempt at tympanocentesis for the documentation of bacterial pathogens?

As there is no mention about such laboratory procedure in the history, it could only be surmised that culture and sensitivity tests were either neglected, ignored or simply unavailable to the patient as she got most of her treatment outside of Metro Manila. In its abscence, however, and for the lack of any comparative local statistics, it has been the practice to utilize data obtainable abroad, even if this is less than ideal. Based on foreign statistics, the following are the most commonly and less commonly isolated:

1. Streptococcus pneumoniae	)	most important
2. Haemophilus influenzae	)	pathogens
3. Respiratory syncitial virus	)	
4. Influenza virus	)	exceedingly
5. Anerobic bacteria	)	uncommon
6. Enteric organisms	)	below 6 weeks of age

In choosing an effective antimicrobial mixture against the principal organism, cost, safety, activity as well as availability of such combinations are always considered. Many such drug mixtures have been tried but the most popular is Ampicillin (penicillin) – Trimethoprim/Sulfamethoxazole (TMP-SMX). To serve as an example this would be taken up briefly.

Penicillin, an antibiotic most commonly resorted to against Streptococcus pneumoniae has been given. At a dose of 55mg/kg/day for ten days, results, should be encouraging as serum levels of penicillin has been demonstrated to decrease during the early part of treatment indicating good response. This is is probably due to control of Streptococcus pneumoniae infection of which only 9 of the 80 known capsular serotypes namely types 1, 3, 5, 6, 7, 14, 18, 19, and 23 are pathogenic. Their capacity to attach to the mucosa is considered a virulence factor and if such attachment to the mucosa is first step for colonization and subsequent tissue invasion, then penicillin in the secretions to prevent such colonization should be of value.

However, Streptococcus pneumoniae is just but one of two pathogens most commonly involved in middle ear infections; the other being H. influenza, which more often than not is resistant to penicillin. This should explain the high serum concentration later in the treatment indicating little or no clinical response. This has been the cause of many failures at conservative management, resistant strains of H. influenza, due to production of beta lactamase enzyme or penicillinase. To this resistant strains, Trimethoprim-Sulfamethoxazole (TMP-SMX) at 40mg/Kg/day is recommended. Favorable response (93%) can be expected after 10 days.

While resistant strains to trimethoprim and sulfonamides have been encountered and identified as plasmid mediated resistance, this is true only if these drugs are given singly but not so when prescribed in combination. A plasmid is an extra chromosomal but intercellular genetic material composed of DNA, which can carry determinants of resistance to one or several (up to 7)

antimicrobials (R-plasmid or R-factor.)

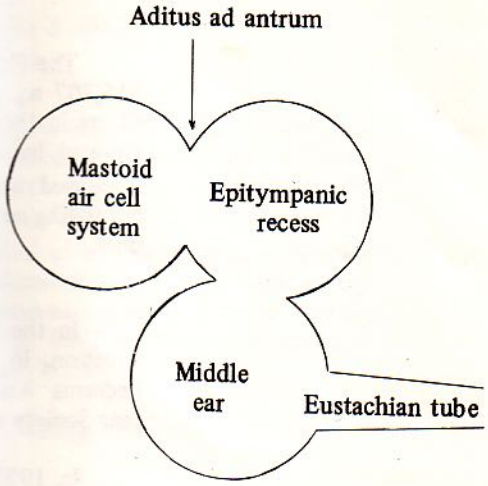
The above rhetoric is presented to rationalize drug therapy in middle ear infections. Short of such rationalization failures with development of complications are bound to occur and when this occurs a purely medical ear becomes a surgical one just like the case presented.

At the operating table, both the middle ear and mastoid cavities were observed full of epithelial debris-cholesteatoma. An expanding tumor, it has destroyed and blocked the usual drainage channel. The products of infection naturally would have to find its way out. Luckily for this youngster, the petro-squamosal suture line offered a point of least resistance thereby allowing for an exit out and the eventual formation of subperiosteal abscess. Evidently, this channel is not enough and so through sheer pressure or some other mechanisms, the infection extended into the labyrinth, perhaps through the round window or through a fistula into the semicircular canal, most commonly the horizontal, created by cholesteatoma. When this developed the patient became vertiginous and because of the introduction of toxic products of infection into the endolymp, the hair cells of the end organ of Corti got involved thereby diminishing the patient's hearing acuity.

COMMENT

Other factors which may influence success or failure of treatment are touched on briefly only. These are:

1. Host's immune response – first line of defense ys. pathogenic organisms
2. Eustachian tube function
   a. Negative middle ear pressure
   b. 0_2 supply of middle ear mucosa
3. Genetics – Children with significant otitis media are more likely to have siblings or parents with history of ear infection
4. Nasal hygiene – intimately related with hygiene of the middle ear
5. Role of adenoidectomy – only factor of questionable value
6. Biological mediators of inflammation
   a. Chemotactic factor
   b. Macrophage inhibitory factor
   c. Activated complement
   d. Prostaglandins
7. Anatomy of the middle ear does not allow for adequate drainage. (See diagram below)



8. Others

Perhaps failure to appreciate the importance of the above parameters even the correct antimicrobial mixture at dosage that result in correct blood levels accounts to a great measure whether drug therapy will succeed or not.

SUMMARY

While the incidence of tympanomastoiditis may not equal those of the pre-antibiotic era, the number of cases seen at the ENT-OPD-Hospital ng Maynila is still high. Actual figures were cited.

A number of reasons were enumerated and probable causes of failure pointed out.

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HEARING AID SELECTION IN THE PHILIPPINES

Nelly Reyes-Ledesma, M.A.*

The Philippines has a population of approximately 48 million and 115,707 sq. miles in land area. There are about 7 active hearing aid fitters in the Philippines. Thus, there are about 6,857,142 inhabitants serviced by a single fitter. An estimated 2,900 hearing aids only are dispensed annually. No government program pays for the hearing aid fitting so that it becomes the financial responsibility of the individual.

In the Philippines, there is no national method for hearing aid selection. In 1974, a method was evolved which is being used at the Ledesma Audiological Center, an accredited member of the Philippine Society of Otolaryngology & Bronchoesophagology, Inc.

In 1977, the Ledesma Audiological Center, Inc. using the trade name King-Aid Philippines was established by a bonafide member of the American Speech & Hearing Association (ASHA) — Mrs. N. Ledesma, a former Assistant Professor at the Philippine Normal College Graduate School of Special Education and Coordinator of the Teacher Training Program for teachers of the Hearing Impaired.

There is no college or university in the Philippines that offers formal training in M.A. in audiology due to lack of facilities, equipment and educators.

The selection process for a hearing aid in the Philippines can be defined as to the process and roles by which hearing impaired persons enter the system to get an aid. The popular phrase in the US now is "Hearing Health Team" and in the Philippines the team has three members: the audiologist, the doctor, and the hearing aid consultant. Audiology procedures are performed by the audiologist, hearing aid consultants, technicians, optometrists and sometimes by medical doctors in the Philippines. The doctor and the audiologist make the diagnosis, if indicated the patient is referred to an audiologist & hearing aid specialist for further hearing evaluation and actual fitting. If the patient is satisfied with the hearing aid he goes back to his doctor or audiologist not to re-check the selection of the aid but to submit to auditory rehabilitation & counselling thereby making a prognosis of each patient's success in adapting to the hearing aid as a rehabilitative device.

The actual procedures are as follows: when the patient responds to the printed ad of King-Aid or is referred by the doctor, the following audiological tests are performed as a standard part of the hearing aid selection test battery:

1. Air conduction test bilaterally.
2. Bone conduction test bilaterally, with masking if necessary.
3. Tone Decay test.

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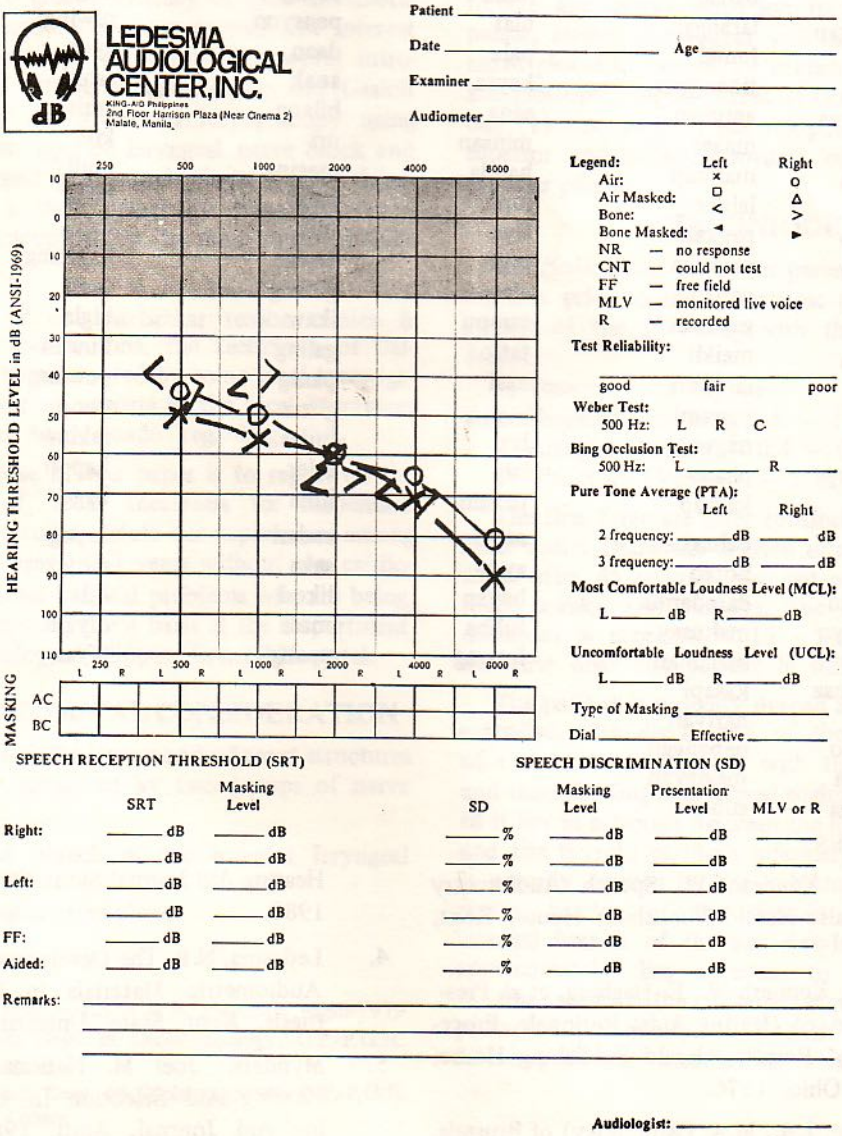
4. Speech Reception Threshold thru the audiometer earphones.
5. Speech Discrimination tests given free field with and without hearing aid fitted.
6. Tympanometric test.
7. Acoustic Impedance Measures
8. Tolerance Level (TL) pure-tone & speech
9. Most Comfortable Level (MCL)
10. Articulation Curves Tests

Fletcher & Steinberg were the pioneers in the field of Articulation Curve Testing as reported in the literature regarding Speech Discrimination Tests. The rationale is that there is threshold curve attainable for intelligibility of speech signals that should rise as the intensity of signals increases. The Ledesma Audiological Center, Inc. audiogram shows on (Figure I) the Pure tone thresholds & Speech Audiometry tests. Patients with a moderate sensori-neural (SN) type of hearing loss will not match the shaded area of the Pure tone audiogram and will have SRT below 20 and SD below 100%

Figure I – Pure-tone & Speech Audiogram



The author developed the Speech Audiometry materials in Pilipino for her masteral thesis at Kent State University in 1974. The test materials for determining SRT and Speech Discrimination in Pilipino (Tagalog), the national language of the Philippines, were developed at the K.S.U. Speech & Hearing Clinic in Ohio, U.S.A. and is now being used by hearing aid centers and some hospitals in the Philippines.

Since there is a limited number of monosyllabic words in Pilipino, two syllable words for threshold testing were used. The three-syllable words were found to produce a 52% score at O dB sensation level (SL) re: pure-tone average. The two syllable words reached a maximum discimination at 25 dB SL (re. pure tone average) with normal hearing Tagalog subjects.

Figure 2 – Speech test material

SRT TEST WORDS

	List I	List 2
1.	malakas	madalas
2.	sasakyan	isipan
3.	alagad	babae
4.	tumanggap	larangan
5.	madali	lumaki
6.	mabuti	tinanggap
7.	kumpanya	anuman
8.	asawa	maaga
9.	gumawa	mahirap
10.	kilala	lalake
11.	mamaya	pagkain
12.	dalawa	masama
13.	talaga	narito
14.	sandali	gagawin
15.	pamilya	maikli
16.	mabait	larawan
17.	pag-asa	marami
18.	totoo	nagwagi
19.	mahigpit	paano
20.	umalis	kausap
21.	halaga	bahagi
22.	ganito	koreo
23.	hangarin	damdamin
24.	prinsipyo	mahusay
25.	gaano	malaman
26.	pambansa	kasapi
27.	sarili	nariyan
28.	negosyo	nabanggit
29.	Kultura	magigyan
30	banyaga	subalit

WORD DESCRIMINATION TEST LISTS

List I	List 2	List 1	List 2
husto	lunsod	batas	lahi
batay	ika	dami	taksi
luma	piling	milyon	gusto
ulat	pensyon	tuwing	kami
pala	daan	ayon	kahit
kaysa	anak	sanhi	harap
sana	bilang	amin	datu
minsan	uri	kita	ani
handa	maging	muli	huli
lupa	balat	labas	sala
siya	tula	dako	bukas
tayo	kundi	hakbang	kanya
alam	ginang	mata	sanggol
sampu	ikaw	bigla	mula
tatlo	galing	buwan	kulay
kasi	panig	puwang	banal
mama	gitna	doon	pati
lagi	lunas	saklaw	tanda
isip	lider	hapon	ginto
pansin	lima	baga	madla
anyo	sudan	kapag	tribu
ayon	saka	ninyo	dito
bayan	likod	tulad	niyon
lubha	masa	diyan	muna
huwag	upang	niyan	gayon

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SUSPENSION LARYNGOSCOPY UNDER LOCAL ANESTHESIA *

Mariano Caparas, M.D. **
Generoso T. Abes, M.D. ***

INTRODUCTION

Local anesthesia for laryngeal endoscopic procedures is being used up to the present. This is carried out by the classical transmucosal route which often yields poor results. The incomplete anesthesia, inconsistency of effectiveness, short duration of action and the relatively high dose of local anesthetic required in doing this method have somehow placed greater reliance on general anesthesia especially with the advent of the operating microscope for suspension laryngoscopy. General anesthesia however has also numerous disadvantages which we need not elaborate.

In recent years reports by several authors regarding the greater efficacy of local anesthetic for peroral endoscopy have revived new interest in this procedure. Anesthesia is however introduced by a different route. Jafek and Gaskill reported on doing peroral laryngoscopy using percutaneous superior laryngeal nerve block and transpharyngeal pharyngeal plexus block. Calcatema went a step further by doing suspension microlaryngoscopy using the same route of anesthesia.

Because of one particular reason, which is economic considerations, the technique of Calcatema has been adopted by some local investigators. However no reports in the local literatures have so far been made regarding this.

The purpose of this paper is to report on the technique of local anesthesia for suspension laryngoscopy and to relate our experiences among 18 patients, ages 18-67 years without any cardiovascular or other medical problems who are being treated on an out-patient basis at the Department of Otolaryngology, Philippine General Hospital.

ANATOMICAL CONSIDERATION

Sensations to the larynx and adjacent structures is essentially subserved by two groups of nerve fibers:

1. Internal branch of the superior laryngeal nerve.
2. Pharyngeal nerve plexus.

The internal branch of the superior laryngeal nerve innervates the mucosa of the larynx, the laryngeal surface of the epiglottis and a portion of the base of the tongue. After the superior laryngeal nerve has divided into an external motor and an internal sensory branch, the larger internal branch descends to pierce the thyrohyoid membrane along with the superior laryngeal artery approximately one (1) cm. anterior to the greater cornu of the hyoid bone, midway between it and the superior border of the thyroid cartilage.

The pharynageal plexus supplies tactile and pressure sensation to the posterior one third of the tongue and tactile sensation to the uvula, soft palate, lateral pharyngeal wall and tonsil. This nerve plexus is formed by branches of the vagus and glossopharyngeal nerves. It lies approximately one (1) cm. deep to the midpoint between the superior and inferior borders of the posterior tonsillar pillar.

TECHNIQUE

Pre-medications are given parenterally 30 - 45 minutes prior to the endoscopic procedure. This consist of the following with their respective dosages:

1. Demerol – 1 mg./kg.
2. Phenergan or Benadryl – 1 mg./kg.
3. Atropine Sulfate – 0.4 – 0.5 mg.
4. Diazepam (Valium) – 5 mgs.

The first three are given routinely via intramuscular route. Diazepam is given intrevenously only when after 45 minutes the patient is still very much awake and anxious. The initial dose of diazepam is repeated if 15 - 30 minutes after the first dose the patient is still too anxious.

The patient is properly draped and the neck is extended. The distal end of the greater cornu of the hyoid is palpated with the index finger and then the finger is moved slightly inferiorly until it lies in a trough between the hyoid superiorly and the thyroid cartilage inferiorly. This trough is actually formed by the indentation in the superior border of the thyroid cartilage. The internal branch of the superior laryngeal nerve approximately lies anterior to the fingertip. In this manner the internal carotid artery is protected posteriorly. A 2 inch gauge 26 or 25 hypodermic needle is advanced until it

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actually pierces the thyrohyoid membrane into the laryngeal cavity; Air is aspirated and the needle is withdrawn gently until no more air is being aspirated. This more or less indicates that the needle lies within the membrane. Two (2) cc. of 2% Lidocaine hydrochloride with 1:100,000 Epinephrine is injected. If the nerve is encountered directly the patient will complain of referred pain in the ear resulting from the stimulation of the auricular branch of the vagus (Arnold's nerve) injection into the nerve is not necessary, however, due to the ready diffusibility of lidocaine. The block is repeated on the other side.

Pharyngeal plexus block is then accompanied by depressing the tongue and exposing the posterior tonsillar pillar (palatopharyngeus). With a long-angled tonsil needle or spinal needle, 2 cc. of 2% lidocaine hydrochloride with 1:100,000 Epinephrine is injected 1 cm. deep at the midpoint of the posterior tonsillar pillar. The needle tip is directed posterolaterally. Aspiration is first attempted to avoid injection into the adjacent carotid artery. This procedure is repeated on the other side. Inability to swallow or a "lump" in the throat are frequent complaints which indicate an effective block.

In cases of vocal cord stripping, local infiltration of 0.2 - 0.3 cc. 2% lidocaine hydrochloride with Epinephrine on both vocal cords is done.

After the surgical procedure patients are sent to the recovery room where the vital signs are checked until stable. They are sent home after about 6 - 7 hours at which time they are already fully awake.

RESULTS:

Table I shows the general tabulation of the results. Eighteen (18) patients were included in this study. Two patients underwent two procedures on separate occassions; hence a total of twenty procedures were done. Fifty per cent (50%) of this consisted of vocal cord stripping for removal of vocal cord nodule or polyp. Punch biopsy was done in thirty five per cent (35%) of cases. This was done among patient with laryngeal new-growth. Direct visualization of the larynx for diagnostic purposes was done in two cases (10%) and excision of epiglottic cyst was done in 1 (5%) patient.

The results of each procedure was evaluated in accordance with the following criteria.

1. Presence or absence of pain.
2. Presence or absence of gag reflex.
3. Effectivity of sedation.

Abolition of pain conotes effectivity of the superior nerve blocks whereas the absence of gag reflex implies the effectivity of the pharyngeal plexus block. The effectivity of the pre-medications is reflected in the state of the patient's sedation. If the patient is well-sedated, it is recorded as negative; conversely, if the sedation is poor it is recorded as positive (+).

To simplify matters, the overall assessment of each surgical procedure is rated as excellent, tolerable, or poor in accordance with the following results: (Table II)

a) Excellent – all negative results.
b) Tolerable – one positive result.
c) Poor – two or three positive results.

The comfort of the surgeon was not considered as a criterion since this is regarded as directly related to any one of the three criteria mentioned.

Table III shows the evaluation ratings of the different procedures. Excellent results were obtained in 80% of cases. Twenty per cent (20%) yielded tolerable result and none was regarded as poor. Nine out of the 10 cases (90%) of the vocal cord stripping cases were rated excellent. Excellent results were likewise obtained in 4 out of 7 (57.1%) of the punch biopsy cases. Direct visualization of the larynx and excision of epiglottic cyst did not present any problem at all and were also rated excellent.

No complication as a result of the anesthtic and/or the surgical procedures was noted in all cases.

DISCUSSION

Doing endoscopic procedure in the larynx is obviously easier and more informative particularly when done under suspension laryngoscopy. It requires less effort and saves the surgeon an assistant who holds and rotates the patient's head and affords him to do the delicate surgical procedures of the larynx such as vocal cord stripping with both hands free using an operating microscope. By doing this procedure under local anesthesia, a greater gain is obtained in terms of a considerable monetary savings.

These benefits should nonetheless compromise the basic objectives of an ideal endoscopic procedure, which is to obtain the most reliable and comprehensive information obtainable from endoscopic examination. This type of information, undoubtedly, is obtained only if the patient is well sedated and anesthetized. Our study shows an eighty per cent (80%) success rate. (Table III) The remaining twenty per cent (20%) was labelled "tolerable" which we do not consider as total failure since we nevertheless were able to do the procedure and obtain valid informations.

TABLE I

GENERAL DATA

PATIENT (Initial)	AGE	SEX	DIAGNOSIS	SURGICAL PROCEDURE	ASSESSMENT
1. P.P.	58	M	Vocal Cord polyp, Bil.	Vocal Cord Stripping (R)	Excellent
			Vocal Cord polyp, (L)	Vocal Cord Stripping (L)	Excellent
2. E.P.	36	F	Vocal Cord nodule, Bil.	Vocal Cord Stripping (R)	Excellent
			Vocal Cord nodule, (L)	Vocal Cord Stripping (L)	Excellent
3. F.R.	42	F	Vocal Cord nodule, (R)	Vocal Cord Stripping (R)	Excellent
4. L.D.	29	F	Vocal Cord nodule, (R)	Vocal Cord Stripping (R)	Excellent
5. S.B.	60	F	Vocal Cord polyp, Bil.	Vocal Cord Stripping (L)	Excellent
6. S.R.	30	F	Vocal Cord Nodule, (R)	Vocal Cord Stripping (R)	Excellent
7, A.C.	42	F	Vocal Cord nodule,	Vocal Cord Stripping (R)	Tolerable
8. E.M.	44	F	Vocal Cord nodule, (R)	Vocal Cord Stripping (L)	Excellent
9. R.S.	42	M	Laryngeal Ca.	Punch Biopsy	Excellent
10. N.D.	43	M	Laryngeal Ca.	Punch Biopsy	Tolerable
11. J.B.	41	F	Epiglottic Mass, (TB)	Punch Biopsy	Excellent
12, M.B.	67	M	Laryngeal Ca.	Punch Biopsy	Excellent
13. A.E.	48	M	Laryngeal Ca.	Punch Biopsy	Tolerable
14. Y.B.	26	F	Laryngeal Ca.	Punch Biopsy	Excellent
15. N.E.	37	F	Anterior Commissure Mass	Punch Biopsy	Tolerable
16. R.D.	18	M	Chronic Laryngitis	Direct Laryngoscopy	Excellent
17. C.C.	46	F	Glottic Stenosis	Direct Laryngoscopy	Excellent
18. P.V.	41	M	Epiglottic Cyst	Excision	Excellent

TABLE II

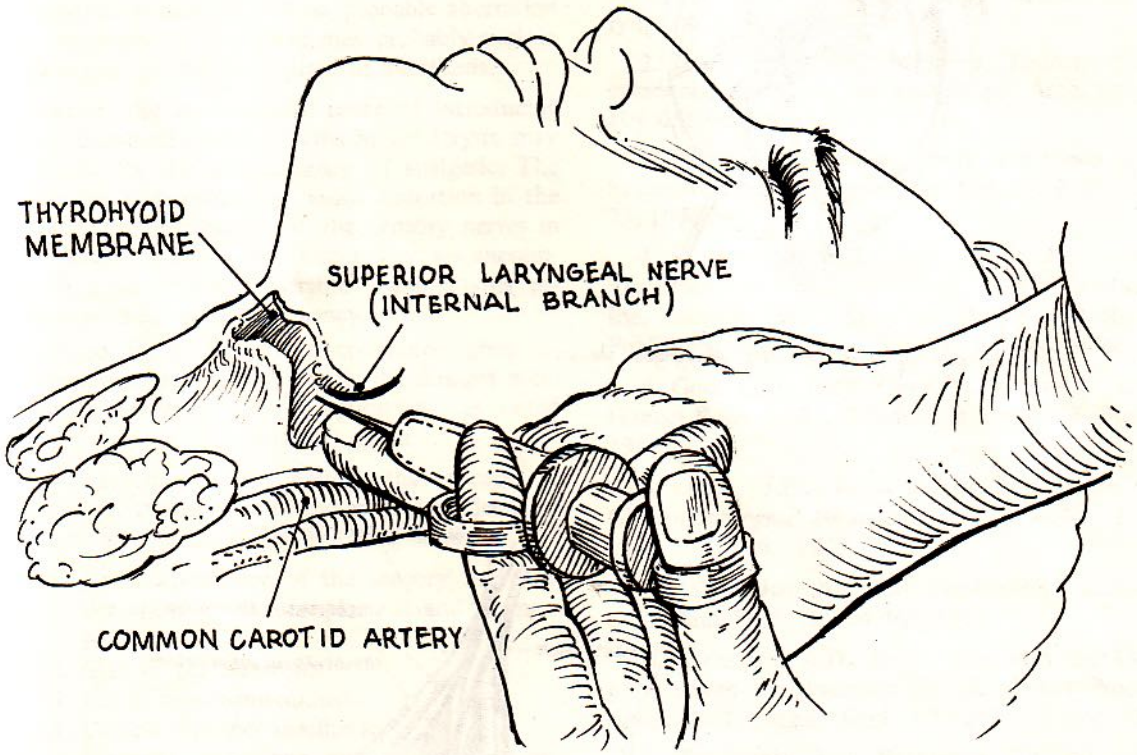
METHOD OF ASSESSING EACH SURGICAL PROCEDURE

	PAIN	GAG REFLEX	PATIENT's ANXIETY	
Excellent	(–)	(–)	(–)	
Tolerable	One positive (+) result			
Poor	Two or Three positive results			

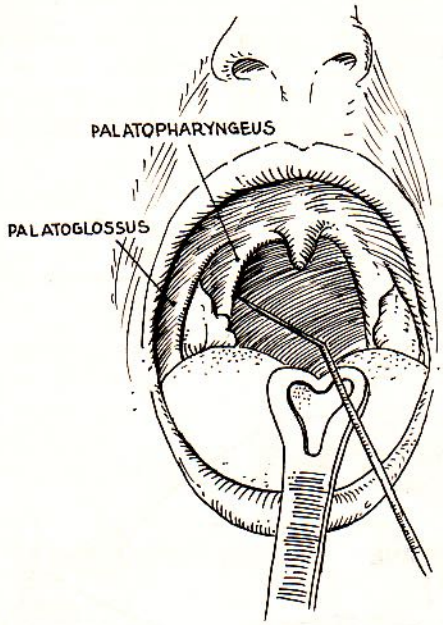
TABLE III

ASSESSMENT OF SURGICAL PROCEDURES

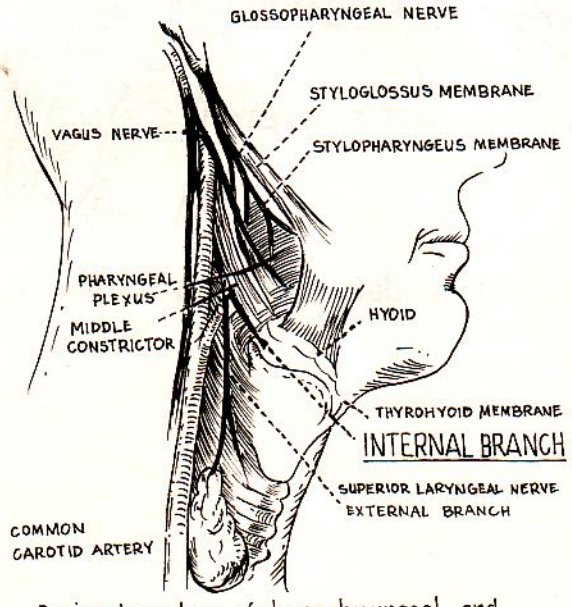
SURGICAL PROCEDURE	NUMBER (%)	ASSESSMENT		
		EXCELLENT	TOLERABLE	POOR
Vocal Cord Stripping	10 (50%)	9 (90%)	1 (20%)	0
Punch Biopsy	7 (35%)	4 (57.1%)	3 (42.9%)	0
Direct Laryngoscopy	2 (10%)	2 (100%)	0	0
Excision	1 (5%)	1 (100%)	0	0
TOTAL	20	16 (80%)	4 (20%)	0



Technique demonstrating superior laryngeal nerve block



Technique of anesthetizing pharyngeal plexus



Regional anatomy of glossapharyngeal and vagus nerves in cervical region

The reasons for the "tolerable" cases encountered in this study is variable. Some of these cases were encountered during the early part of the study. We surmise that lack of familiarity with the sensory innervation of the oropharynx and laryngopharynx as well as inadequate technical skills could probably explain this result. On the other hand, some patients were simply more difficult to anesthetize. These patients are usually obese with short broad neck. We realized that percutaneous superior laryngeal nerve block was particularly more difficult to carry-out among these patients. Although Lidocaine is easily diffusible in tissues, the greater bulk of the subcutaneous tissues as well as probable aberration in the course of the nerve may probably explain the reason for the inadequacy of anesthesia.

As in the transmucosal route of introducing local anesthetic, new growths in the larynx may account for the inconsistency of analgesic. The enlarging mass somehow causes distortion in the anatomical distribution of the sensory nerves in the larynx. This is the reason why we encountered none of the "tolerable" cases among patients with laryngeal malignancy.

In so far as sedation is concerned, good sedation was accomplished with the dosages mentioned previously. No complication was noted as a result of the sedatives given.

To summarize, we believe that success in carrying out suspension laryngoscopy under local anesthesia depends on the following factors:

1. Good knowledge of the sensory nerve innervation, of the oropharynx and laryngopharynx.
2. Skill of the Surgeon.
3. Use of proper instrument.
4. Choice of proper anesthetic.
5. Patient's neck type and presence or absence of anatomical distortion of the oropharynx and or laryngopharynx.
6. Good sedation.

COMMENTS:

Our experiences with the eighteen (18) patients included in this study gives us the impression laryngoscopy when done under local anesthesia that allows one to evaluate the mobility of the vocal cords better. In cases of vocal cord nodules, one can visualize well how the nodules interfere with the normal apposition. Redundant mucosa which may not be so apparent unless the patient vocalizes may be similarly noted.

As in most surgical procedures, suspension laryngoscopy becomes such cheaper when done much under local anesthesia than when done under general anesthesia. This idea is of particular significance to service hospitals such as government hospitals. The expenditure per procedure is not only less but a greater number of patients are served since the patients need not be hospitalized.

For all its benefits, however, suspension laryngoscopy under local anesthesia has also its pitfalls. We believe that these can be overcome as more experience is gained in the future.

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THE DIAGNOSTIC VALUE OF SIALOGRAPHY IN PAROTID TUMORS

Dr. Carlos Dumlao*
Dr. Rodolfo B. Dela Cruz*
Dr. Joselito Legaspi*

Sialography was first suggested by Barsony in 1925. Since that time the interest in the procedure as a diagnostic aid in parotid tumors has waxed and waned. Some clinicians consider the examination mandatory for the accurate information it will provide, while some never use the procedure claiming that the technique serves no useful purpose.

To resolve this controversy the authors decided to conduct a local retrospective correlative study that compared sialographical diagnosis with the surgical and histologic findings.

METHODS AND MATERIALS:

This study involves 48 patients who had undergone sialography and subsequent parotid surgery. The sialography was done via the distention technique using lipiodol.

The equipment required for the sialography consist of a no. 60 polyethene, punctum dilator set of lacrimal probes, a stopper for the tubing, syringe, contrast material, sialogogue and xylocaine.

At PGH we have trimmed down the needed materials to a blunt spinal needle, contrast material, syringe, xylocaine and a sialogogue (mango or calamansi is excellent.).

The first step in the procedure is to get a scout film, PA and lateral views to detect any stones or osseous changes.

The anatomic relation of the parotid duct and buccinator should be taken into consideration because the parotid duct is perpendicular to the buccinator muscle, eversion of the cheek is necessary for the insertion of the catheter into the duct. The sharp angulation of the parotid duct raises the possibility of rupture if the cheek is not turned outward. The volume of dye injected to the parotid gland is usually .5 to 1.5 ml. or as usually is the case injection is stopped when the patient experiences a mild discomfort.

PA and lateral views are again taken. The patient is advised to chew the sialogogue and we wait for 15 to 20 min. before taking the post-secretory films, making sure, we have removed the needle to avoid confusing it with the scout films.

The authors viewed the sialograms and itemized the following interpretations based on the presence or absence of a mass, whether the mass is extrinsic or intrinsic, localization of the lesion whether deep or superficial, estimate size of the lesion and whether benign or malignant.

We also reviewed the chart to include operative and surgical pathology reports and then compared it with the sialographic findings.

Diagnostic problems usually arise from distinguishing between an intrinsic and extrinsic lesion and determining whether a mass is benign or malignant. As a general rule, however, benign lesions are well circumscribed; malignant lesions are infiltrative.

The intact ductal system resembles a winter tree with evenly distributed branches gently tapering off toward the periphery. The Stensens duct normally measures not more than 3 mm. in diameter.

The hallmark of a benign intrinsic lesion is the pressure effect on the smaller ducts, there might also be a localized defect in acinar filling. Benign tumor tend to displace the ducts without destroying them so that the ducts appear smoothly stretched around the mass. The axis of the gland is also maintained.

An extrinsic mass causes compression and displacement of the gland, even though the internal architecture maybe distorted the radicles will fill eventually. If small, the sialogram will appear normal.

As a rule no problem exists in distinguishing between an intrinsic and extrinsic mass when a lesion is centrally placed because deep lobe lesion shows a rather characteristic medial ballooning which might be described as an umbrella effect.

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Fig. 1

Fig. 1 Shows the anatomical relationship of the Stensen's duct to the buccinator muscle.

Fig. 2

Fig. 2 Malignant lesion showing retention of dye

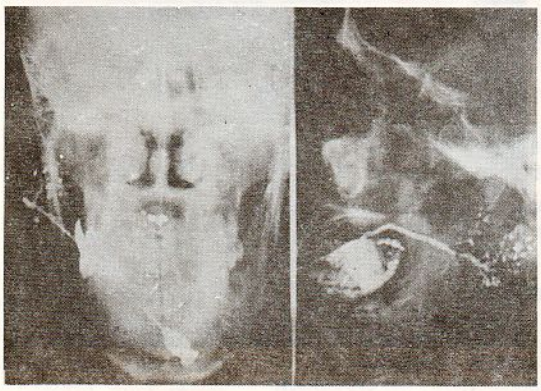
Fig. 3

Malignant lesion showing fuzzy outline of the ducts

Fig. 4

Superficial lesion showing compression of ducts

Fig. 5

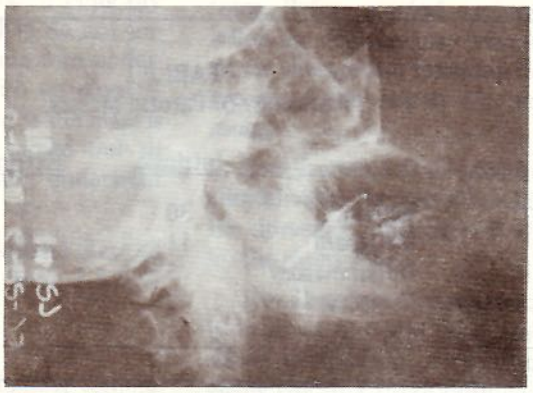


Tree with leaves pattern

Fig. 6

Benign lesion showing medial balooning or umbrella effect

Fig. 7



Splaying of ductal system

Malignant lesion showing destruction of ductal system.

The major problems will arise if the lesion is more peripherally placed. A peripheral lesion may cause some shift in the position of the gland and its appearances may be similar to that of an extrinsic mass. However, it is wise to remember that an intrinsic peripheral lesion will exhibit a filling defect while an extrinsic lesion will not.

An infiltrating malignant neoplasm tend to destroy ductal and acinar tissue leading to irregularity of the ducts as well as pools of contrast within the destroyed gland parenchyma.

Some authors felt that they can differentiate benign from malignant lesions on the basis of irregularity. This pattern was seen in 62% of their cases of malignant parotid tumors and they believe it to be specific. Others felt less confident. Certainly the destructive changes should suggest malignancy but their absence is no proof of benignancy.

Below is the histology of the parotid tumors in this series.

TABLE I
Histology of Parotid Masses

	Intrinsic	Extrinsic
Benign	30	3
Malignant	11	0
Inflammatory	5	
Cyst	2	

TABLE II
Individual Breakdown

Malignant lesion	Benign	Inflammatory
1. Mucoepidermoid Ca-6	1. Benign-mix-19	1. lymph node (TB)
2. Adenoid Cystic Ca-2	2. Whartins – 3	2. acute and chronic inflammation-2
3. Adeno Ca-2	3. hemangioma–2	3. chronic sialoadenitis
4. Epidermoid Ca–1		

Inflammatory lesions of the parotid may also appear as parotid masses hence the need to differentiate them from true neoplasm.

Inflammatory conditions could be divided into acute and chronic, however since sialography is contra-indicated in acute lesions we will confine ourselves solely to chronic parotid lesion which could be divided into obstructive either due to calculi or stricture or non-obstructive parotid conditions.

Failure to fill the ductal system may indicate faulty technique or an obstructive lesion. However calculi rarely totally occlude the lumen, the contrast material will flow around leaving a radiolucent bubble or radio-opaque lesion.

Radiolucent stones cannot be distinguished from an air bubble so that we should be extra careful to exclude it from the syringe.

Other radiologic findings are that the main ductal system and its tributaries are dilated proximal to the obstruction.

Non-obstructive sialectasia may follow autoimmune, collagen, vascular and frequently chronic infection without stricture.

These inflammatory lesions are often referred to as subacute sialosis. The radiologic findings is terminal sialectasia with normal ductal structures. Enlargement at the tips of the contrast column gives the filling phase of the x-ray film an appearance of a tree with leaves. Another finding is a delayed emptying time, a gland that does not empty in 10 to 15 min. after the administration of a sialogogue is strongly suggestive of increased alveolar pressure and an abnormal gland.

TABULATION OF RESULTS

	No. of Patients
Detection of a mass	48
Size to within 1 cm.	48
Extraglandular	3
Intraglandular	45
Surface lesion	28
Whole lobe	7
Deep lobe	10
Malignant lesion	11
Benign lesion	32
Inflammatory	5

Of the 48 patients studied 44 were detected on sialography or about 91.66%. 3 patients with extrinsic lesion were missed all having measurements of about 1.5 cm or less. One intrinsic lesion with a diameter of 1 cm. was missed. Subsequent histopath revealed a parotid cyst.

There were few patients with extrinsic masses who underwent sialography because if clinically they indicate a non-parotid mass they do not undergo sialography. The three patients who underwent sialography were the ones who on physical examination it could not be decided if the mass is intra-or extraparotid. Sialography turned out to be normal so that they subsequently underwent excision.

The 44 sialographies that were positive were all intrinsic tumors with sizes ranging from 1.5 to 7 cm.

Of the 45 patients with intraglandular tumors 28 presented are superficial lobe lesion. We have detected 24 of these or 85.71% average. Seven patients presented with whole lobe lesions; we detected 7 or 100%. Ten patients presented with deep lobe lesions; we detected nine giving roughly about 90%.

We have 32 patients with benign lesion; we detected 29 giving 90.62% detection rate.

Five patients presented with inflammatory lesions; we have detected 3 patients. The two missed inflammatory lesion were diagnosed as benign because they presented with a vague mass with no inflammatory changes on sialography. We have 11 patients with malignant tumors. The reviewers detected 9 lesions the others were erroneously diagnosed as benign tumors.

At present it is generally conceded that the magnitude of the surgical intervention in parotid tumors depends on the extent of the lesion. We have been taught in our undergraduate years that history and physical examination alone could make 80% of our diagnosis. Still we need laboratory exams to help us with the remaining 20% and also to confirm the 80% we have diagnosed so that pre-operatively we and the patient will be fully aware and prepared for the possible consequences of surgery.

Our study seem to indicate the following: we have seen that intrinsic tumors having a diameter of 1.5 cm. or more could be detected on sialography so that a palpable mass of 1.5 cm. or more in the parotid area with a normal sialogram would indicate within reason an extrinsic parotid mass.

It is important for the clinician to recognize whether a mass is extraparotid or not, because as a rule all intrinsic masses will require prompt surgical intervention because all salivary gland lesion have a malignant potential.

The management of an extrinsic lesion is more challenging in as much as such lesion will include enlarged inflammatory periparotid lymph node, metastic cancer and tumor of the adjacent structures. Before surgical exploration of an extrinsic lesion the clinician may wish to undertake diagnostic or therapeutic measures to treat an infectious process or to search for an unknown primary cancer.

Localization of an intrinsic lesion is of some clinical value because this will prepare the surgeon the forseable difficulty if the lesion is located in the deep lobe.

The diagnosis of malignancy was made correctly in about 81.8% of cases. Malignant lesion usually shows destruction of the ducts and acinar tissue giving rise to a fuzzy outline of the duct. The two patients missed showed a benign sialographic pattern so that the absence of such pattern will not exclude the possibility of a malignant lesion.

The value of predicting malignancy is obvious as the patients can be prepared for the possible sacrifice of the facial nerve, radical neck dissection and or a modified temporal bone resection.

In conclusion we could say that sialography can provide reasonable accurate information about the location, size and possible pathology of the mass all of which may help modify the therapeutic approach to the patient's condition.

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NEEDLE ASPIRATION BIOPSY *

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All too often patients consult a physician for a lump in the neck for which not even a thorough and complete physical examination is done. Moreover, the patient is prescribed antibiotics without establishing the etiology of the disease to the detriment of the patient's health and to the physician's intellectual health.

Take the case of M.B., 57, male who six months PTA felt lateral neck masses associated with left earache and later diminished hearing. Episodes of blood tinged nasal discharge was noted. He consulted a physician, who prescribed antibiotics without relief. And the case of F.B., 45, male, who two years PTC consulted a physician in Capiz and was advised biopsy. However, the patient didn't have the biopsy due to financial reasons.

Borne of our experiences in having to deal with head and neck cancer in the advanced stage, we felt the need to institute this study on aspiration needle biopsy as a reliable, safe, and inexpensive procedure on an out-patient basis. Foremost in our minds was the practical application the procedure has as a tool for which a physician in the provincial setting may make use of for the early diagnosis of a mass in the neck.

Very important was the need to correlate results from needle biopsy with surgical specimen either through wedge or excision.

Aspiration needle biopsy, according to Dr. Eric Saltzman, means the cutting puncture and the negative pressure withdrawal through a hollow needle of a sample of cells and bits of tissue suitable for histologic examination. Historically, the modern use of this technique dates from 1930 when Martin and Ellis reported on 65 cases of malignant tumours. After a quiescent period, renewed interest was stimulated by Scandinavian investigators, Einhorn and Franzen in 1962 and Eneroth in 1967. Crile and Hazard in 1951 warned about dangers of implantation of cancer with aspiration biopsy.

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Methods

Patients with a mass in the head and neck underwent aspiration needle biopsy in the out-patient department. Criteria for patient selection were: 1) mass should not be smaller than 2 cm in diameter; 2) there should be no break in the skin; 3) excluded were frank infection; 4) excluded were tumours which could be biopsied by punch, i.e. oral Ca.

Specimens were collected and fixed in slides under standardized technique and sent to surgical pathology. A master list was kept with the patient's name, sex, age; size and location of the mass, the impression and the histopathologic readings. The patients in the list were followed up subsequently underwent wedge or excision when they are operated subsequently in Floor 15 with the final histopath results noted in the list.

Materials

1. Menghini type biopsy needle Gauge 17 with depth gauge and built-in obturator
2. Luer-Lok metal syringe, 50 cc capacity
3. Blade handle with blade 11
4. Two glass slides
5. Formalin, absolute methanol
6. Syringe with 2 cc. xylocaine 2%

Technique

1. The site is sterilized and anesthesized. The site of puncture is selected in such a way it is in the line of later skin incision.

2. A stab wound is made through the full thickness of the skin.

3. While the mass is palpated and fixed in place with one hand, the obturated needle is guided to enter the tumour.

4. While vacuum is exerted, the needle is moved

back and forth or around within the tumour.

5. Specimen is fixed. If the specimen is small and indistinct, smear between 2 slides with firm, flat pressure and then fix in absolute methanol. If the specimen is corelike and distinct, place in small squares in blotting paper and soak in 10% formalin.

6. Site of puncture is pressure dressed.

Results

The majority of our 36 patients was in the age group between 31-40 yrs. Our youngest was 8 months and the eldest was 68 years old. The males predominate at 55% and the females at 45%. As to the location of the mass, 5% of the masses were found in the parotid area. The neck was divided into the anterior and posterior triangles by the sternocleidomstoid. Seventy-five percent were located in the posterior triangle and while 20% in the anterior triangle. The smallest mass biopsied was 2 x 3 cm in a case of branchial cleft cyst while the largest was 12 x 12 cm in a possible NPCa.

The impression based on history and physical examination were:

NPCa	28%
Lymphoma	14%
Koch's Adenitis	11%
Parotid Newgrowth	11%
Thyroid Ca with Neck Metastasis	8%
Submandibular Newgrowth	8%
Branchial Cleft Cyst	3%
Thyroglossal Duct Cyst	6%
Diffuse Non-toxic Goiter	6%
Base of the tongue Ca with Neck metastasis	3%
Hemangioma	3%

The average time mass was first seen and felt to the time of our biopsy was 20 months.

During the first few weeks of our study we experienced the following pitfalls:

1. Tissue insufficient for diagnosis.
2. Smear too thick for diagnosis.

As our experience with the technique widened we got more positive results. These are the highlights:

1. S.A. with an impression of NPCa, showed the needle biopsy diagnosis of pleomorphic adenoma. Shown is an organized pattern with an attempt to form glands and pallisading of stromal cells.

2. E.A. with an impression of Submandibular Newgrowth surprisingly showed cholesterol clefts (needle shaped spaces which has undergone hemorrhage) and amorphous material (indicates Cystic mass Contents). Negative for a typical cells. Foamy cells atypical are his tiocytes which phagocytosed lipid material. This indicates the lesion is benign.

3. The needle biopsy of E.P. with an impression of NPCa rule out Koch's Adenitis showed caseation necrosis. The granular eosinophilic materials with mononuclear infiltrates suggest this. Wedge biopsy shows hyaline material with thin flat cells around. Diagnosis: Chronic inflammation non-specific.

4. C.S.A. complained of 22 years duration, an anterior neck mass of which moves with deglutition, firm, nontender, well delineated measuring 4 x 5 cm. Impression was thyroglossal duct cyst. Needle biopsy: yellowish creamy discharge about

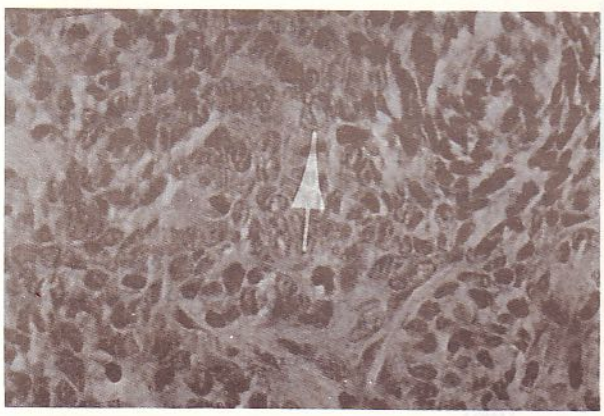
Fig. 1

Shows the necessary materials for needle aspiration biopsy.

Fig. 2

Patient with a huge neck mass

Fig. 3



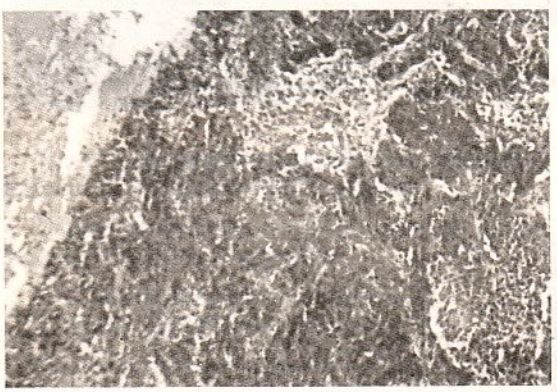
An organized pattern of aspirated material with an attempt to form glands and pallisading of normal cells.

7 cc. aspirated from the mass. Histopath reveals histiocytes ++, lymphocytes ++, neutrophills ++, epithelial cells +, muscle tissue (–) for malignant cells.Wedge biopsy: fibroadiposed tissue and lymph node. No diagnostic abnormality seen. This clinches the diagnosis of a benign lesion but it doesn't prove it is thyroglossal duct cyst.

5. C.B. 56, female, presented with a 3 x 4 cm. mass subdigastric associated with dysphagia. Impressiom: Ca base of tongue w th neck metastasis. Slides of needle and wedge biopsy show epidermoid Ca grade IV, poorly differentiated.

6. E.S., 45, male, presented with an 8 x 7 cm. mass posterior triangle (R) 5 x 6 cm. mass in (L) posterior triangle of two years duration. Impression: NPCa. Needle biopsy slide showed anaplastic Ca metastatic, primary site is Nasopharynx. There is haphazard arrangement of the cells in this example. The Nasopharyngeal biopsy done at the same time was read as chronic inflammation. Nasopharyngeal biopsy result is not puzzling since cervical lymph node metastasizes occur early while the primary is still quite small. The focus might be just a slightly raised and ill-defined granular patch on nasopharyngeal mucosa.

7. C.T., 35, female was referred from Internal Medicine OPD for a 10 x 8 cm. on the right side of neck and 5 x 4 cm. left located in the posterior triangle of 5 years duration. Impression was Papillary Thyroid Ca with neck metastasis rule out NPCa.



Top – Squamous Cell Ca,
poorly differentiated

8. E.M. had an impression of NPCa. Needle biopsy showed malignant lymphoma, Class III, histiocytic type. Attention is called to the typical histiocytes with abundant pale staining cytoplasm and cytologically benign nuclei. Needle biopsy showed malignant lymphoma, Class III histiocytic type. Wedge: muscle tissue

9. D.B., 38, male, complained of a 12 x 5 cm. mass in the posterior triangle of 3 years duration. Nasopharyngeal biopsy: chronic inflammation. Nasopharynx clear. Impression was NPCa. Needle and wedge biopsy showed Squamous Cell Ca, metastatic, lymph node.

10. M.B., 57, male with a 12 x 12 cm. mass left posterior triangle, 12 x 6 cm mass on the right of 4 months duration with decrease hearing and episodes of blood tinged, nasal discharge, post rhinoscopy showed funggating mass (L). NPCa. Needle biopsy: Squamous Cell Ca, Anaplastic. Wedge biopsy: Squamous Cell Ca. NPbiopsy chronic inflammation.

11. R.D., 31, male, presented a 7 x 10 cm. (R) posterior triangle mass of 4 months duration. Needle and wedge biopsy showed squamous Cell Ca. Nasopharyngeal biopsy: chronic inflammation.

Overall, we got positive results in 30 out of 36 patients who underwent needle aspiration biopsy or 83%. False negative findings were 2/36 or 6%

Needle aspiration biopsy has its place in the diagnostic battery of a mass in the neck with advantages of simplicity of instrumentation, ease and inexpensiveness of the procedure. We have met the challenge in this study by evolving and standardizing the technique and provided, in turn, a challenge for the Pathologist. The necessity of close cooperation between the surgeon and the pathologist is emphasized to increase the efficiency of the yield in needle aspiration biopsy.

In conclusion, therefore, Francis Bacon is quoted as follows: "If a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties.

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LINGUAL THYROID – A New Look at its Etiology

Angel Enriquez, M.D.*

INTRODUCTION

In 1869, Hickman first described lingual thyroid as a clinical entity and since then and up to 1980 only about 300 cases have been reported.

PURPOSE

The purpose of this paper is to offer a new and a more plausible explanation as to how and why it occurs.

DISCUSSION

Before presenting arguments debunking the widely accepted theory of maldescent or its failure to go down, allow me to enumerate the prevailing views among noted authorities in its support.

Adornato and Saunders wrote " – lingual thyroid is the result of failure of the thyroid anlage to descend along the thyroglossal duct from the primitive forgut to its normal position in the neck."[2] (See Figure 1) Adams, G.L. et al agreed " – the thyroid originates between the two anatomic divisions of the tongue (and) migrates caudally ventral to the arches. The foremen cacum at the base of the tongue marks the point at which the thyroid gland begins its embryologic descent to its position in the newborn."[4] Thorek supported the same opinion when he wrote, "With further descent, the thyroid eventually reaches its definitive location infront of the hyoid bone and the laryngeal cartilages –." Along the same line, Weider and Parker, in an exhaustive review of the literature on lingual thyroid, opined that "Toward the end of the 4th week it – migrate(s) caudad along a path, ventral to the pharynx." Of the 39 references reviewed by them not one doubted the validity of the maldescent theory. To top it all, Arey, the embryologist, stated that " – over migration to an abnormally low location sometimes occurs." The sentiment is similar among countless others who share the same view – always a descent to its usual location in the neck.

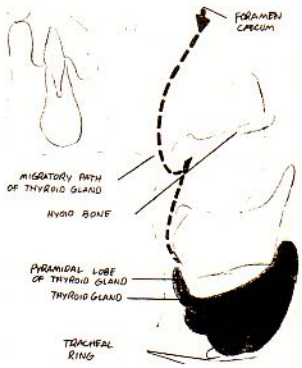


Fig. 1

Why, it might be asked, should the primitive thyroid." descend?" Is it like the testis, which if undescended, is prone to malignancy or that the high temperature within the abdomen will not allow for normal spermatogenesis? As far as the thyroid is concerned, no such similarity has been reported. Assuming, for the sake of argument, that it must – what makes it migrate downward and how? Is there anything similar to the gubernaculum testis – as it relates to the gonands – that pulls it down? Or something that may push it caudalwards? (Fig. 2) Or is it a process of attraction – chemical like that of phagocyte to a bacterial body due to its nucleic acid content; or is it one of electrotaxis? These are questions others have not supplied any satisfactory answer.

COMMENTS

To start with, all prevailing views just presented ignored one basic embryologic fact – the development and eventual displacement of the tongue. How and why the development of the tongue was not at all considered or given importance is beyond comprehension.

In a 2 mm. embryo, the primitive thyroid, the primordia of the tongue, the aortic trunk and the pericardial cavity are bunched together in an area which is still under-

Fig. 2

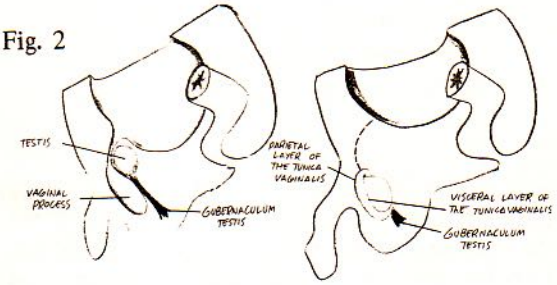
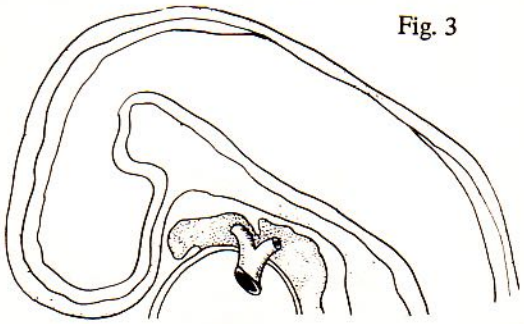


Fig. 3



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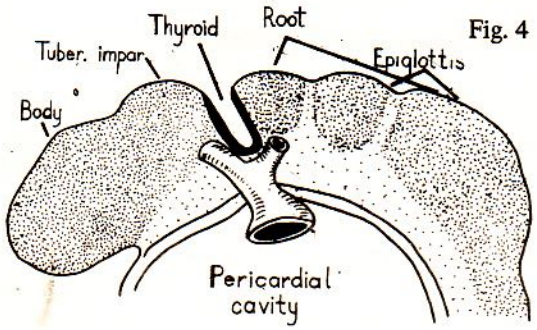


Fig. 4

going differentiation. In other words, the thyroid is close to the future contents of the thoracic cavity. And of the recognizable structures, the thyroid is seen attached to the body of the tongue by means of a stalk (thyroglossal duct) which is the keystone of this contrary opinion. Normally, by the 5th week of gestation, the thyroglossal duct atrophies and becomes completely obliterated, thus setting the thyroid free. However, and this is very important, if the thyroglossal duct persists and fails to elongate then the primitive thyroid is permanently attached to the tongue so that if the latter migrates upwards, as it does with the elongration of the pharynx during the 7th week by interstitial growth so as to approximate the growth of the embryo as a whole, then the thyroid is pulled cephalad leaving the aortic trunk and the pericardial cavity behind. Fig. 5 Had

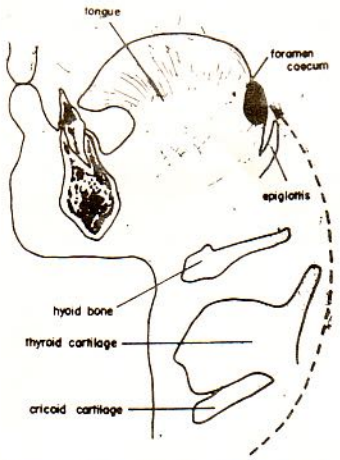
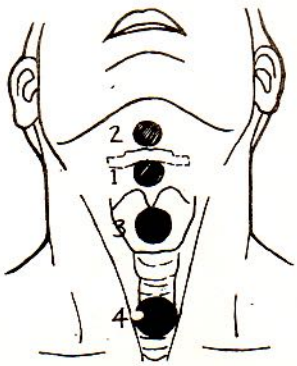


Fig. 5

stalk been obliterated, the gland would have been left behind in its normal position. Or if the duct allowed itself some elasticity for stretching, then the primitive thyroid may still remain in its



normal position in the neck or anywhere between that site and the foramen cecum (See Fig. 5.)

As a colloborative evidence that the tongue migrated cephalad, is supported circumstantially in that its striated muscle is innervated by the hypoglossal nerve, both structures – muscle and nerve-belong ancestrally to the region caudal of the branchial arches.[1] In other words, the masses of the tongue are derived from the lower mesodermal tissues which migrate cephalad as indicated by the innervation of the tongue by the hypoglossal nerve.[3]

Table I

Arch I	Fifth Cranial nerve (Trigeminal)
Arch 2	Seventh Cranial nerve (Facial)
Arch 3	Ninth Cranial nerve (Glossopharyngeal)
Arch 4	Tenth Cranial nerve (Superior laryngeal branch of the vagus)
Arch 6	Tenth Cranial nerve (Recurrent laryngeal branch of the vagus)

(Arch 5 never appears externally but is buried deep near the origin of the lower respiratory tract. For reasons of comparative anatomy, it is labeled Arch 6. The XII nerve develops from the epipericardial ridge, which is caudal to the last arch.)

CONCLUSION

Faced with these incontrovertible facts, one can only conclude that the thyroid is already where it ought to be at the time of its formation and that it is not a failure to descend, which at best is illusory, but a pulling upwards by the displaced tongue that explains the presence of thyroid tissue at its base.

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H I S T O R Y

Second induction ceremony at the Manila Hotel in 1959 with former Secretary of Health Elpidio Valencia inducting the officers of the Philippine Society of Otolaryngology & Bronchoesophagology, Inc.

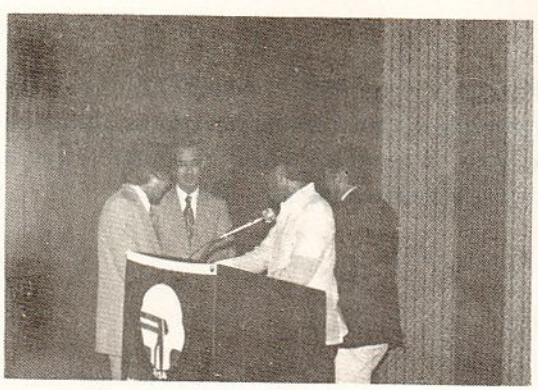
From the left to right: Drs. Armando Chiong – Director; Tierry F. Garcia – Immediate Past President; Ariston Bautista – Vice President, Macario Tan – President; Angel Enriquez – Secretary; Milagros Santos-Lopez and Eusebio Llamas – Directors.

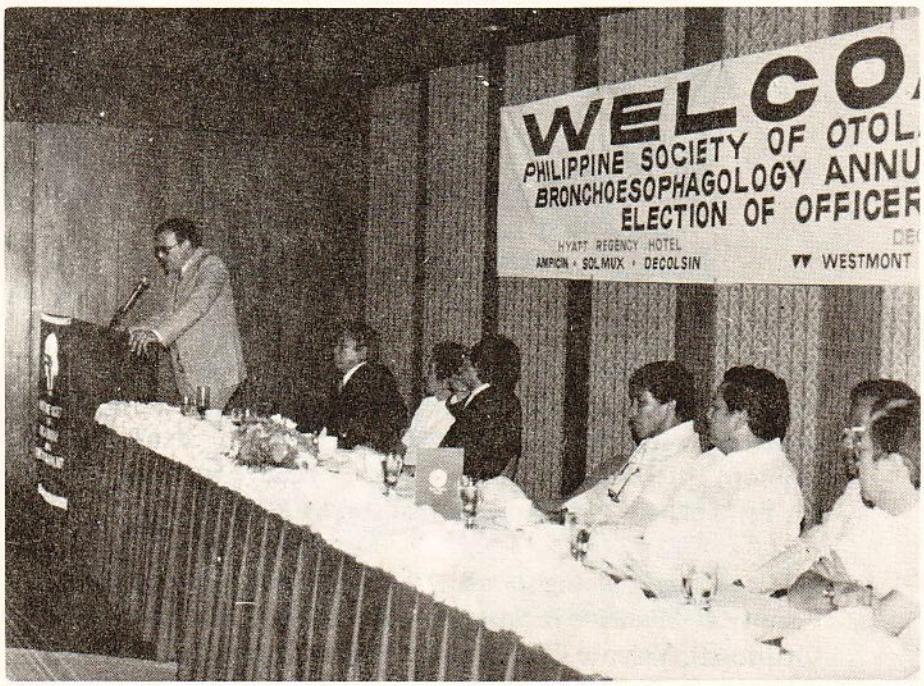
CURRENT EVENTS

Election of New Officers of the Philippine Society of Otolaryngology & Bronchoesophagology, Inc. at the Hyatt Regency December 1980.

Above: Incoming and Outgoing Presidents – Drs. Abelardo Perez and Mariano Caparas.

Below: New Diplomates of the Philippine Board of Otolaryngology, Inc. receiving their certificates from Dr. Napoleon Ejercito (President) and Dr. Armando Chiong (Secretary-Treasurer). In background is Dr. Angel Enriquez who acted as Emcee.





Above at the Hyatt Regency with Dr. Trevor Farrington of Manchester, England delivering his lecture on "Cancer of the Larynx." On the Presidential table are Drs. A. Enriquez, C. Reyes, M. Caparas, A. Perez and N. Ejercito.

At the Midtown Ramada on the occasion of the induction of the new set of officers of the Philippine Society of Otolaryngology & Broncho-esophagology, Inc. on February 14, 1981.

From left to right: Drs. Napoleon Ejercito, Eusebio Llamas, Remigio Jarin – Directors: Teodoro Llamanzares – Secretary; Abelardo Perez – President; Jesus Co – Vice President. Not in photo – Dr. Manuel Lim – Director. Inducting officer is Dr. Perla Santos-Ocampo – PMA President-elect.

Below: Otolaryngologists from the University of Sto. Tomas Faculty of Medicine & Surgery – Drs. Eusebio Llamas (Dept. Chairman), Vicente Chiong and Milagros Santos-Lopez, (Consultants.)

Still at Midtown Ramada, above photo, on the Presidential table may be recognized PMA President Jaime Laya, PMA President-elect Dr. Perla Santos-Ocampo and Dr. Manuel Lim Director of the Philippine Society of Otolaryngology & Bronchoesophagology, Inc.

Below is Dr. Remigio Jarin – Otolaryngologist from the University of the East, who acted as Emcee.

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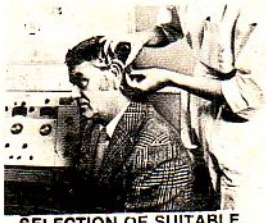

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