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THE PHILIPPINE JOURNAL OF OTOLARYNGOLOGY HEAD & NECK SURGERY
1986

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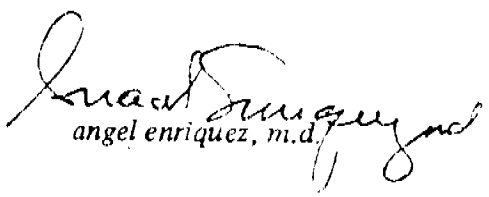
EDITORIAL

THE THIRD ASEAN OTOLARYNGOLOGICAL CONGRESS

In this era of phenomenal advances in science and technology, the 3rd Asean Otolaryngological Congress -- to be held in Manila on December 4-6, 1986 - offers an opportunity for all its member countries to exchange views and share experiences to solve the various problems in Otorhinolaryngology peculiar to this part of the world. The interchange of knowledge will not only enhance progress in our field of specialization but will also benefit people especially in Asia.

It is, therefore, a great pleasure to greet all the delegates and participants to this congress.

To the Philippine Society of Otolaryngology -- Head & Neck Surgery, Inc. which has accepted the responsibility of holding this all important affair and more particularly to all the officers and members of the organizing committee -- congratulations.



angel enriquez, m.d.

President's Page

Dear Colleagues:

Like all those who have preceded me in this exalted position, I assume the leadership of our society with conflicting emotions of gaiety and anxiety, of jubilation and trepidation.

For more than just an honorific office that must be filled, the presidency of the Philippine Society of Otolaryngology is a ponderous responsibility that must be borne with dignity and discharged with efficiency.

The fact that I follow in the footsteps of our past presidents, like Dr. E. Llamas, Dr. Abe Perez, Dr. Mar Caparas and Dr. Jess Co, to mention a few makes my task even more difficult, for their performance is hard to duplicate, and I am bound to suffer in comparison. For this reason, I am determined to continue and pursue much of their program, in the belief that the safest course for a new president is to take the trail already blazed, the path already paved by his predecessor. In the words of Mr. Shakespeare, one should not attempt to improve on a masterpiece.

Accordingly, there will be no major deviations from the schedule of projects and program of activities that the previous administrations boldly initiated and assiduously implemented.

In the area of medical education, we will continue the periodic presentation of interesting and instructive cases. In the area of research, we will strive to enhance the surgical skills and advance the medical know-how of the residents of our various medical centers. And, of course, we will endeavor to give the full measure of our support and encouragement to the 3rd Asean Otolaryngological Congress which we will host in Manila this year.

Earlier, I adverted to the formidable challenges and problems before us. I refer particularly to the crisis in our national economy and the horrible consequences it has had on our profession and practice.

As a result of the tight money situation engendered by this crisis, the flow to our country of technology, of knowledge and of information has trickled to a drop. This means that otolaryngological advances made in the industrialized countries will not be immediately available to us, either for study or for application. This means, that our practitioners and students will lag behind otolaryngological developments, making our country somewhat backward and behind the times insofar as this branch of medicine is concerned.

What can we do to accelerate the flow to our country of advanced technology and up-to-date knowledge? Offhand, I can think of making representations with the various foreign agencies here to send us books and materials on the latest advances. Also, I would urge that the more fortunate among us share with the rest of us whatever literature on advance knowledge they may be able to get. I am finally thinking of instituting some kind of library system to which each of us can contribute materials and from which all of us can borrow the same.

I now close by reiterating my congratulations to Dr. Co for his successful stewardship of our Society in 1984 and my thanks to all of you for trusting me with the presidency of our Society. With our cooperation and assistance and with the aid of Divine Providence, I am confident that despite the crisis that beset our country and the challenges that confront our Society we will move forward, we will triumph, we will ultimately succeed in doing God's work on earth.

Thank you and God bless us all.

Remegio Jarin, M.D.

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PERSONAL EXPERIENCES IN ENT SURGERY

Manuel G. Lim, M.D., F.P.C.S.*

Mr. President, Dr. Romeo Espiritu, Dr. Gloria Lim, Dr. M. Caparas, Dr. J. Co, Dr. de Ocampo, distinguished guests, colleagues, ladies and gentlemen. It is indeed an honor and privilege to be the Alcantara Memorial Lecturer. I acknowledge the wisdom of my predecessors who had given this particular lecture and I am also aware that there are colleagues of ours, equally if not better qualified than myself who could be addressing you today. While I hesitated initially to accept this invitation, but due to the insistence of our esteemed president, Dr. Romeo Espiritu and our incomparable, infatigable Chairman of the Dept. of Ophthalmology, U.P.-P.G.H. Medical Center, Dr. Gloria Lim, I finally acceded. It is, therefore, with great humility and in the spirit of seeking further improvement that I stand before you tonight to share with you some of my personal experiences that led to the modifications and innovations of certain ENT surgical procedures. Unfortunately, all my slides from the operating microscope are hopelessly blurred, so I will present only my personal surgical experiences in the nose and throat. To many of you, these modificiations of operation may not be necessary but to the younger otolaryngologists, these techniques may give them some food for thought; they may try to follow or improve on these procedures in the days to come.

Nasal Obstruction

Table 1

Causes of Chronic Nasal Obstruction

I. Diffuse Mucosal Hyperplasia
   A. Allergy
   B. Vasomotor Rhinitis – caused by drugs, endocrine factors, cigar or cigarrette smoking and others.
   C. Chronic Infection of the Nose and Sinuses

II. Anatomic Deformity
   A. Congenital -- facial asymmetry; atresia
   B. Acquired – deviated septum with hypertrophied inferior turbinates, nasal fractures.

III. New Growths of Nose and/or Sinuses
   A. Benign – polyps, papillomas, adenomas, gliomas, chondromas and other benign tumors.
   B. Malignant – epidermoid carcinomas, adenocarcinomas or others.

IV. Foreign Body

V. Nasopharyngeal
   A. Adenoid hypertrophy
   B. Tumors – benign and malignant

There are causes of chronic nasal obstruction. However, this is beyond the scope of this paper. I will talk only on chronic nasal obstruction secondary to septal deviation with hypertrophied inferior turbinates (see Fig. 1).

Figure 1

In our clinical practice this condition is frequently encountered. Very often, otolaryngologists disregard the hypertrophied inferior turbinates. They go ahead and do a submucous resection on the nasal septum or septoplasty. To our disappointment, many of the patients return to the office without relief of the nasal obstruction. Why are the patients not relieved after the septoplasty? The reason is very obvious. Many of these patients have hypertrophied inferior turbinates aside from the deviated septum with spurs. The complete relief may not be obtained without something being done to the hypertrophied inferior turbinates. This I discovered during my residency training both in P.G.H. and in Montreal, Canada and during my early private practice.

Methods to Reduce the Inferior Turbinates

1. Inferior Turbinectomy – condemned.
2. Electro-cautery of Inferior Turbinates ineffective.

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3. Cryosurgery
4. Laser Surgery
5. Submucous Resection of Inferior Turbinates — very effective and most economical for surgeons.

At first, I tried to do submucosal cautery with needle electrodes to reduce the erectile tissue of the cavernous plexus of the inferior concha. This did not seem to help. In 1964, I started to try submucous resection of the inferior turbinates aside from doing the septoplasty or submucous resection of the nasal septum.

Anesthesia

In the early days of my practice, when cocaine was still available, I used to operate on the septum and on the inferior turbinates under topical cocaine anesthesia and local infiltration with procaine or xylocaine with adrenaline, 1:100,000. This combination seems to work very well. I usually inject 1 cc. of local anesthesia to the anterior tip of the inferior turbinates after the septoplasty. This reduces the bleeding tremendously. There is actually minimal amount of bleeding to obstruct your view during the dissection of the inferior turbinal bone.

Later in my practice, i.e., since 1967 when I transferred to Medical Center Manila, I started to do this operation under general anesthesia with local xylocaine-adrenaline infiltration. This method is very much more comfortable to the patients, and usually, this is the choice of the patients. The patient is first put to sleep with "IV" Penthotal Sodium, and the usual oro-tracheal intubation was done (see Fig. 2).

Figure 2

Position

As soon as the patients are put to sleep under general anesthesia, the operating table is manipulated to a semi-reclined position with the head and body in a semi-recumbent position, and the legs higher than the buttocks to prevent the patient from slipping down the operating table. If the patient is operated under local and topical anesthesia, either the same position as in general anesthesia or in the semi-sitting position with the legs down. Personally, I prefer general anesthesia and the position under general anesthesia. This makes the surgeon more relax.

Inferior Turbinate

The inferior nasal concha is an independent, either slender or thick, scroll-like lamina of bone developed by ossification in the infolded caudal border of the lateral plate of the cartilaginous nasal capsule. It articulates by its attached border with the turbinate crest of the maxilla and with the lacrimal bone. Farther dorsad the attached border contributes to the closing of the hiatus of the maxillary sinus and articulates with the conchal crista of the palate behind. The causal border is free and is usually thickened and laterally curled; the lateral surface is concave, and the medial surface is convex (see Figs. 3 & 4).

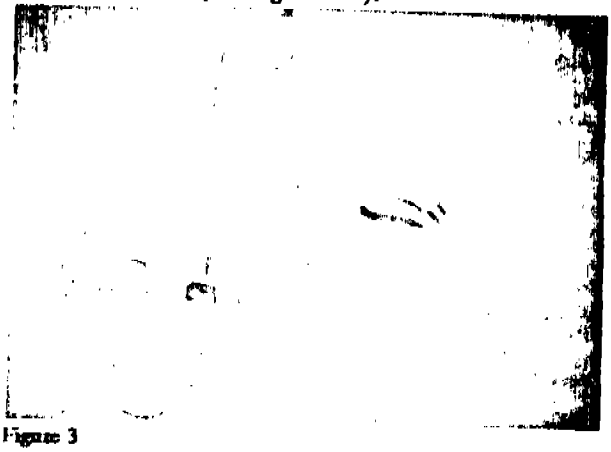

Figure 3

Figure 4

Clinically, the inferior turbinal bone varies in thickness. Some inferior turbinal bones are 5-7 mm. thick but some are 1-2 mm. thick or paper thin. The thick ones are much easier to remove surgically, and the thin ones are much more difficult to dissect because they break easily and they seem to be more adherent. In the thin ones, the submucosal tissue is much thicker, and sometimes it may be necessary to do a partial inferior turbinectomy on the antero-inferior end so as to give an adequate airway after the operation.

Technique of Submucous Resection of Inferior Turbinate.

The technique of submucous resection of the inferior turbinates is as follows:

1. Prepare 50cc. of 1% xylocaine solution with adrenalin, 1:100,000.
2. Aspirate 10cc. of this solution into a 10cc. syringe for later use.
3. Soak tiny nasal strips of gauze in the 1% xylocaine solution with adrenaline, 1:110,000.
4. Gently pack the nasal cavities with these soaked tiny nasal strips. The object here is to cut down the bleeding and to decongest the nose so that the surgeon can have a clear view during surgery.
5. While waiting for the packings to take effect, inject locally the caudal end of the septum to block or to cut down the bleeding from the Kisselbach's vascular plexus (from the anterior ethmoidal, the facial, the greater palatine and the medial sphenopalatine vessels). I also infiltrate some solution to block the anterior ethmoidal arteries injecting between the upper and the lower lateral cartilages through the nasal vestibule. The packings are left for a period of 5-7 minutes and are removed with the bayonet forceps.
6. Usually, I start with the septoplasty or submucous resection of nasal septum before proceeding to submucous resection of the inferior turbinates. I am sure, all of you are masters in submucous resection of nasal septum, so this does not have to be discussed.
7. The next step after septoplasty is to infiltrate locally 1cc. of xylocaine-adrenaline solution to the anterior tips of both inferior turbinates.
8. Usually, I start with the left inferior turbinate. I incise the anterior tip of the inferior turbinate vertically about 3-4mm. behind the limen nasi (this seems to blend with the anterior end of the inferior turbinate). The incision is done with B-P No. 15 knife and is carried down to the inferior turbinal bone. Be sure the periosteum is incided (see Gis. 5 & 6).

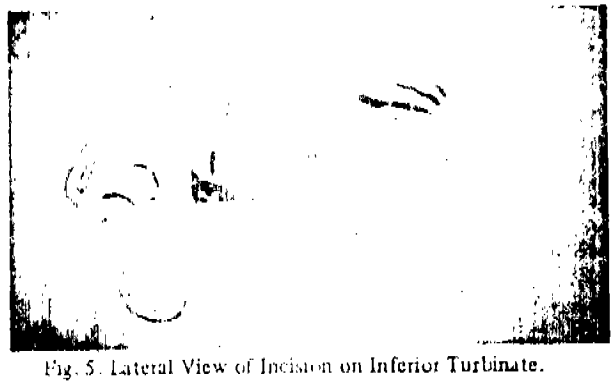

Fig. 5. Lateral View of Incision on Inferior Turbinate.

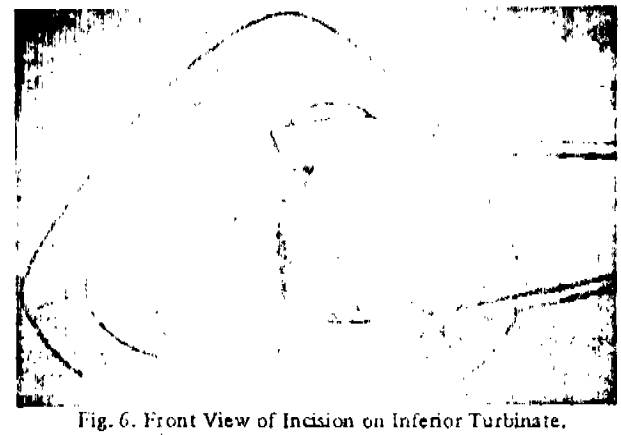

Fig. 6. Front View of Incision on Inferior Turbinate.

9. This is followed by dissecting the inferior turbinate under the periosteum to expose the inferior turbinal bone by using the sharp Freer's elevator and the suction elevator (see Fig. 7),

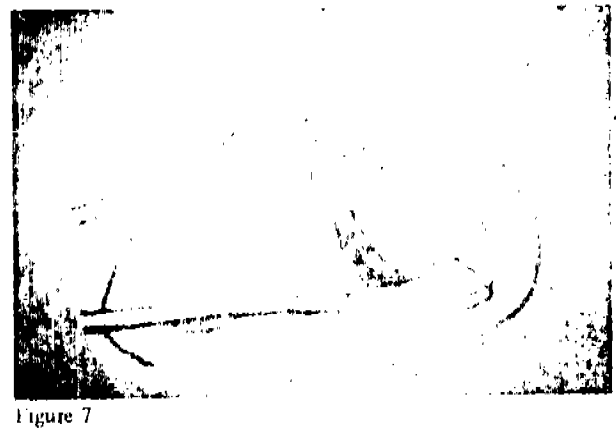

Figure 7

10. When the turbinal bone is exposed, the anterior attachment is broken with the chisel. This should be done gently (see Figs. 8 & 9).

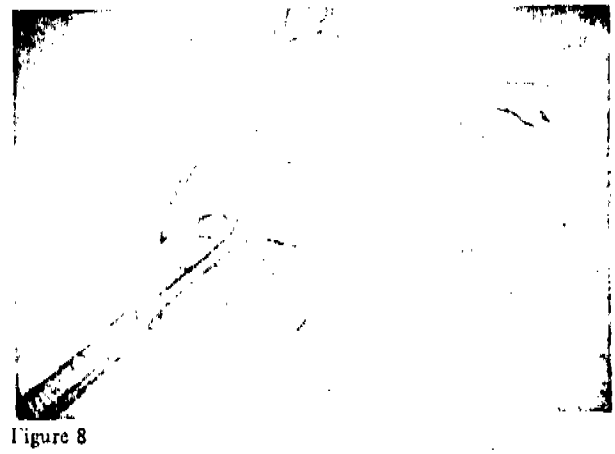

Figure 8

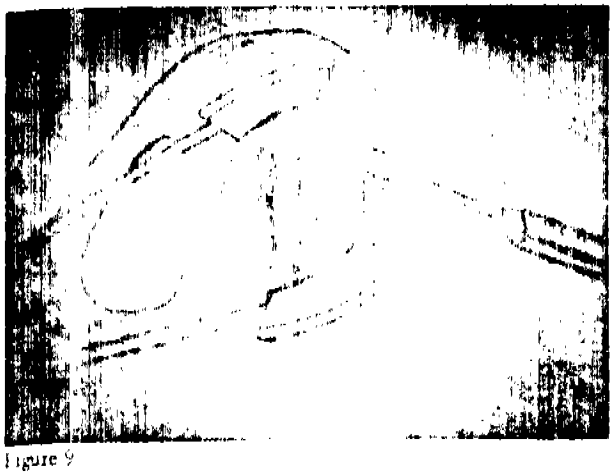

Figure 9

11. With the Vienna-Storz or Killian (2") nasal speculum to spread the incision and soft tissues, the inferior turbinal bone is dissected both the medial and lateral surfaces. This should be done carefully and gently to prevent laceration and actual turbinectomy. Once the anterior 1/3 of the inferior turbinal bone is exposed, the exposed inferior turbinal bone is grasped with the straight Blakesley's forceps and removed (see (Figs. 10 & 11). The bleeding during the procedure is usually minimal. The posterior 2/3 of the inferior turbinal bone is thin, weak and very adherent. This does not need to be removed. Out-fracture of the posterior 2/3 of inferior turbinal bone is done with the blunt Freer's elevator to give an adequate airway.

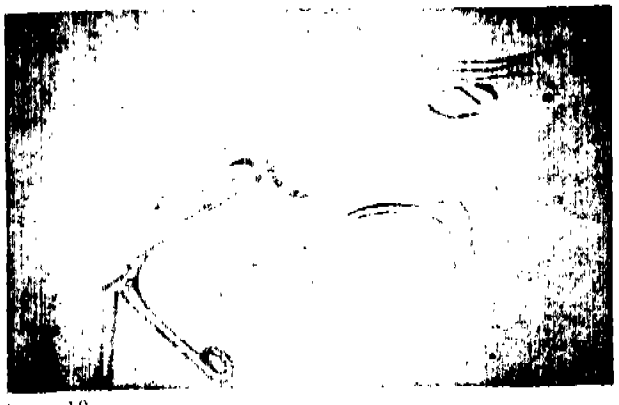

Figure 10

12. The incised wound does not have to be sutured. It falls together again, and a piece of soaked tiny nasal strip is placed between the septum and left inferior turbinate.
13. Similar procedure is done to right inferior turbinate.
14. When the procedure is finished, the nasal cavities are packed with vaselinized strips of gauze. The packing is done with the help of the wider and longer Killian nasal speculum to prevent the incised wound or flap from opening again or displaced.
15. The nasal packings are left for 24 hours and are removed. The bleeding is usually very slight and can be controlled easily with cotton balls soaked with Neo-synephrine 1/4% nasal solution. These soaked cotton balls are left between the septum and inferior turbinates for a few minutes. The bleeding usually stops, and the nasal cavities are cleaned with the nasal suction.
16. The patient is discharged from the hospital one day after the removal of the packing to be sure that there is no bleeding after the removal of the packings.
17. Complete healing usually takes about a week.

Results

Table I

Year	Number of Operations
1964	52
1965	98
1966	112
1967	123
1968	140
1969	151
1970	126
1971	118
1972	128
1973	103
1974	97
1975	82
1976	76
1977	104
1978	72
1979	87
1980	64
1981	53
1982	49
1983	54

20 years Total No. of Operations = 1,927

Number of patients improved – 1,696 cases (88%)

Number of patients with partial improvement – 231 cases (12%)

The partial improvement is attributed to the early years of operation without proper selection of cases. Patients with allergy and having septal deviation with hypertrophied inferior turbinates are poor candidates for this operation because the improvement is only short-lived unless the allergy is properly controlled.

Contraindications

1. Nasal allergy. This should be properly controlled first before the operation. This contraindication is only relative and not absolute.
2. Any medical condition which may be too risky for the patient to undergo anesthesia and operation.

Complications

So far, I have not encountered any post-operative bleeding from submucous resection of inferior turbinates. The nasal packings are removed 24 hours after operation, and no re-packing is ever done.

In this series, there are two cases of post-operative septal hematoma which develops 3-5 days after the operations. Both cases undergo incision and drainage with heavy antibiotic coverage to prevent abscess formation. Both patients recover speedily without any serious consequence.

The next modification of ENT surgery which I would like to present is tonsillectomy.

Table III

Indications for Tonsillectomy

I. Definite Indications for Tonsillectomy
   1. Recurrent episodes of acute tonsillitis.
   2. Peritonsillar abscess.
   3. Tonsillar hypertrophy obstructing airway and deglutition.
   4. Diphtheria carrier.
   5. Excision biopsy for possible malignancy.
   6. Tonsillitis resulting in febrile convulsions.

II. Relative Indications for Tonsillectomy
   1. Recurrent sore throat.
   2. Recurrent upper respiratory infections.
   3. Failure to thrive.
   4. Cervical tuberculous adenitis.
   5. Persistent cervical lymphadenopathy.
   6. Systemic disease secondary to beta-hemolytic streptococci infections (rheumatic fever, rheumatic heart disease, glomerulonephritis).

Anatomy

The palatine tonsils are located in the tonsillar fossa bounded anteriorly by the glossopalatine arch or anterior pillar and posteriorly by the pharyngopalatine arch or posterior pillar and superiorly by the semilunar fold. Inferiorly, it blends with the lateral wall of the oropharynx. The tonsillar capsule is formed by the pharyngeal aponeurosis. Outside of the capsule is loose connective tissue termed as peritonsillar space. This loose connective tissue connects the capsule to the muscles: palatopharyngeus, palatoglossus, superior pharyngeal constrictor and middle pharyngeal constrictor. Outside of the muscle is the buccopharyngeal fascia.

Blood Supply

The arterial supply of palatine tonsil comes from tonsillar branches of lesser palatine artery and ascending pharyngeal artery superiorly and tonsillar branches of dorsal lingual artery, facial artery (main) and ascending palatine artery inferiorly. The veins form a paratonsillar venous plexus and drain chiefly by way of the tonsillar branch of the lingual vein and also through the pharyngeal venous plexus.

Modified Technique of Tonsillectomy

1. All patients are done under naso-tracheal or oro-tracheal general anesthesia.
2. The head of the patient is hyper-extended by slightly lowering the head part of the operating table.
3. The surgeon stands on the right side of the patient; the assistant stays on the left side of the patient; and the anesthesiologist stays at the head part of the patient.
4. The McIvor mouth gag or the Jenning's mouth gag is placed with the assistant holding the tongue of the patient down (see Fig. 12).

Figure 12

5. Xylocaine 1% with adrenaline, 1:100,00 about 5-10 cc. is infiltrated around the tonsillar fossa to cut down the bleeding during the procedure.

6. The assistant holds the Yankauer suction to retract the soft palate to one side.

7. The upper pole of the tonsil is grasped with tonsil grasper or Allis forcep or tonsil artery clamp. The tonsil is pulled medially to expose the mucosa between the posterior pillar and the anterior pillar (the plica semilunaris).

8. Incision was done with a Bard-Parker No. 12 knife. The incision starts with the mucosa posteriorly betwwen the posterior pillar and the tonsil, and the knife is drawn upwards and forwards, incising the mucosa of the semilunar fold, and then downwards on the mucosa between the anterior pillar and the tonsil (see Fig. 13). Be sure that the capsule of the tonsil is not incised, otherwise the parenchyma of the tonsil will be exposed, and the plane of the surgery is lost.

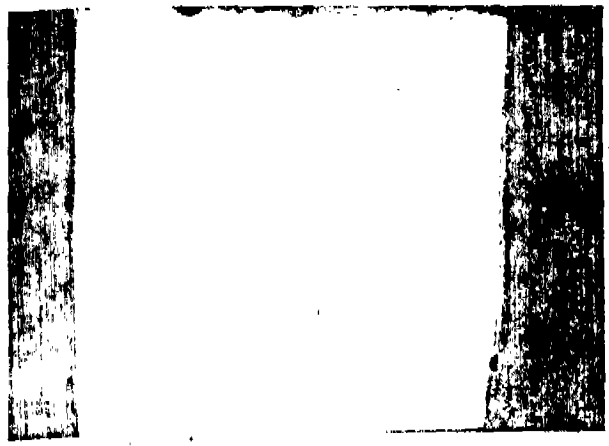

Figure 13

9. With a fine pointed tonsil scissors, the incision is widened and deepened superiorly outside of the tonsillar capsule in the peritonsillar space.

10. As soon as this is done, the superior pole of the tonsil is depressed with the rounded end of pillar retractor. This pushes the tonsil medially and downwards away from the peritonsillar space.

11. The tonsil is then grasped with a clamp or grasper, and dissection downwards is carried on with a piece of gauze sponge on the Allis forceps. The tonsil is dissected gently downwards until the whole tonsil is out of the tonsillar fossa, and it is only attached at the base with the mucosa and some muscle fibers.

12. At this stage the base is clamped, and the tonsil is removed with scissors (see Figs. 14 & 15).

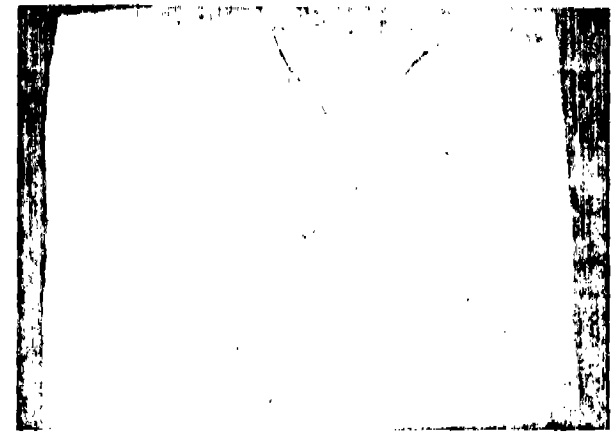

Figure 14

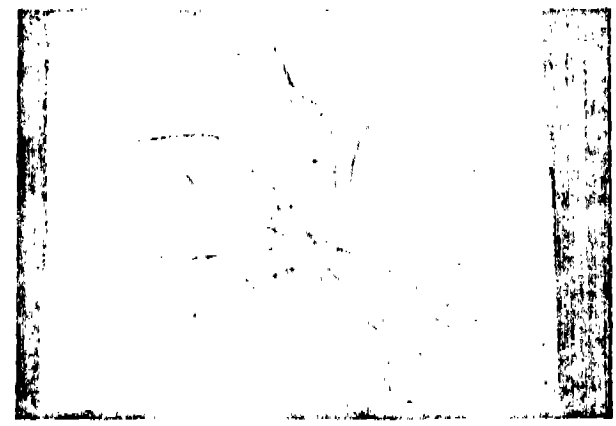

Figure 15

13. The clamped base is sutured continuously with 3-0 chromic catgut sutures. The suturing is done with the needle around the tonsillar clamp. Be sure not to make deep bites because the glosso-pharyngeal nerve may be injured (see Fig. 16).

Figure 16

14. After suturing the base, the bleeders above can be taken care of either with suture-ligatures or electro-cautery. The bleeders above the base are not much of a problem.

15. As soon as the tonsillar fossa is clean and dry, similar procedure is done to the right tonsil.

16. When the tonsillectomy is completed, the tonsillar fossae of both sides are checked properly. If there is no evidence of bleeding the endotracheal tube is removed, and the patient is brought to the recovery room.

17. The intravenous fluid is maintained for 24 hours just to be sure that there is no primary post-operative hemorrhage. If there is primary bleeding (within 24 hours after the operation) the patient can be brought back to the operating room, and re-suturing to arrest the bleeding can be done promptly under general anesthesia.

18. Patient is discharged from the hospital after 24 hours if there is no evidence of hemorrahge or other complications.

Results

The number of tonsillectomies and tonsillo-adenoidectomies is not counted anymore. I am sure there are several thousand cases. So far, I do not encounter any primary post-operative bleeding. I had 3 secondary post-operative hemorrhage from infection. The bleeding in these cases is not severe and usually it can be controlled by electro-cautery in the office except in children. These usually occur 3-5 days after the operation.

Summary

Nasal obstruction secondary to septal deviation is almost always associated with hypertrophied inferior turbinates, especially the turbinate opposite to the side of the hypertrophied inferior turbinate. Septoplasty or submucous resection of the nasal septum alone is not adequate to relieve the nasal obstruction. This procedure has to combine with submucous resection of the inferior turbinates to render complete relief to the patients. The technique of this procedure is presented, and the results of over a thousand cases for a period of 20 years are given. If the allergic patients are excluded, the improvement is almost 100%.

A modified technique of tonsillectomy is presented here to minimize the bleeding during and after the surgical procedure.

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SENSORINEURAL HEARING LOSS AFTER RADICAL MASTOIDECTOMY *

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Romeo L. Villarta, Jr., M.D. ***
Victoria C. Sarmiento, M.D. ****

Introduction

Surgery has always been considered the mainstay in the treatment of chronic otitis media. Because of inherent resistance of the chronic pathologic processes to medical therapy, surgery features prominently in the treatment of chronic otitis media. The surgical procedure usually performed is either a classical radical or a modified radical mastoidectomy with or without tympanoplasty. As well all know, the aims of surgery in chronic otitis media are three-fold. In their order of importance, they are:

First, prevent or control otogenic suppurative intracranial complications;

Second, obtain a dry ear and eradicate disease; and

Third, preserve or improve hearing.

Several authors have observed the development of sensorineural hearing loss after tympanomastoidectomy which aggravates the pre-existing conductive hearing loss among patients. We have undergone this study to document this observation.

The objectives of this study are:

1. determine the incidence of sensorineural hearing loss after radical mastoidectomy ;and
2. determine the patterns of sensorineural hearing loss.

*First Prize
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Materials and Methods

Patients with chronic otitis media who underwent radical mastoidectomy at the Department of Otorhinolaryngology, UP-PGH Medical Center from January to December 1982 were included in this study. Puretone audiograms, both preoperative and four-weeks postoperative, were done for each patient. Patients with mixed hearing loss noted preoperatively were excluded from the study. The material collected from these patients were analyzed.

Results and Discussion

There were 53 patients in this series. There were 28 males and 25 females with an average of 13.7 years. All of the patients underwent radical mastoidectomy. The operative findings and operative procedure done were similar in all of the patients. The preoperative preparation used was povidone-iodine scrub. Bone work made use of high speed drills. The mastoid cavity was packed with chroramphenicol powder and gauze impregnated with tetracycline ointment.

Of the 53 cases, 48 patients did not develop sensorineural hearing loss. Five patients (9.4%) developed sensorineural hearing loss. One patient (1.4%) developed profound hearing loss, while four patients (8.9%) developed high tone perceptive deafness.

The first pattern noted was that of profound hearing loss in a 20-year-old male who underwent radical mastoidectomy in the left ear. *Figures 1* and *2* shows the preoperative and postoperative audiograms respectively.

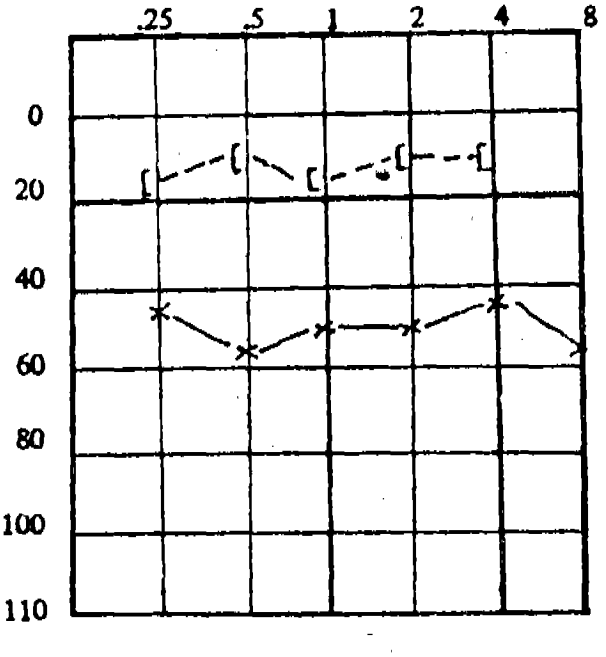

Fig. 1 Preoperative Audiogram

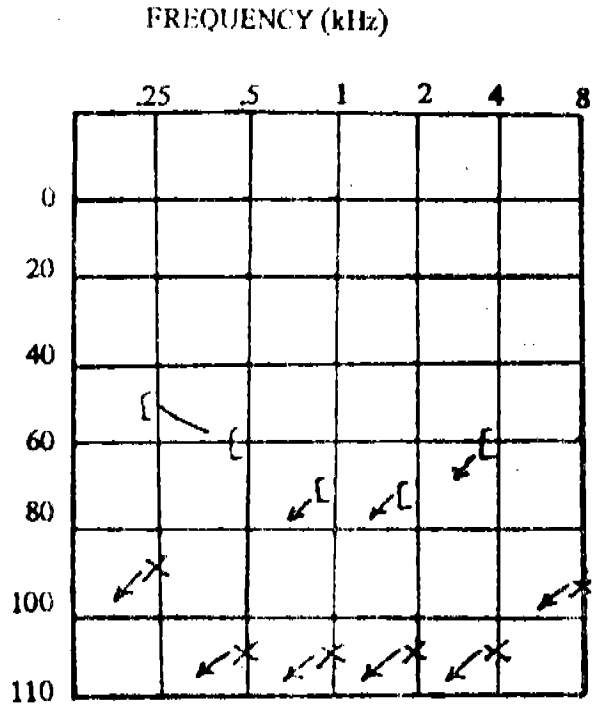

Fig. 2 Postoperative Audiogram

The second pattern, seen in four cases, is exemplified by the preoperative and postoperative audiograms (shown in *Figures 3* and *4*) of an eleven-year-old male who underwent radical mastoidectomy in the right ear.

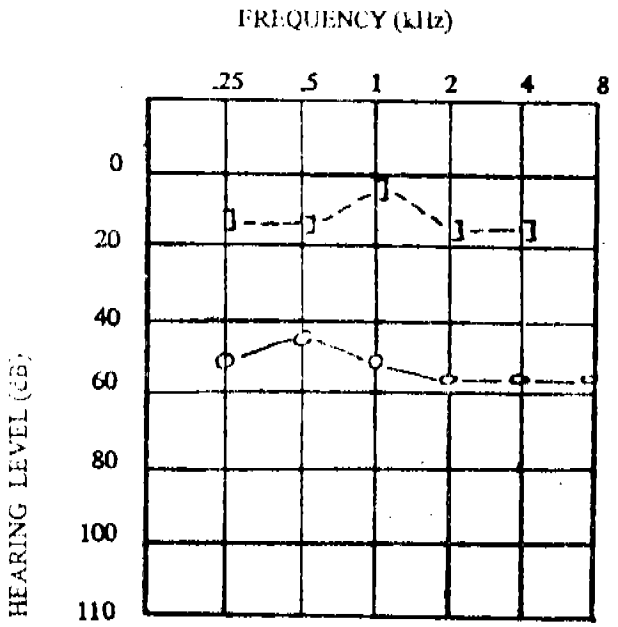

Fig. 3 Preoperative Audiogram

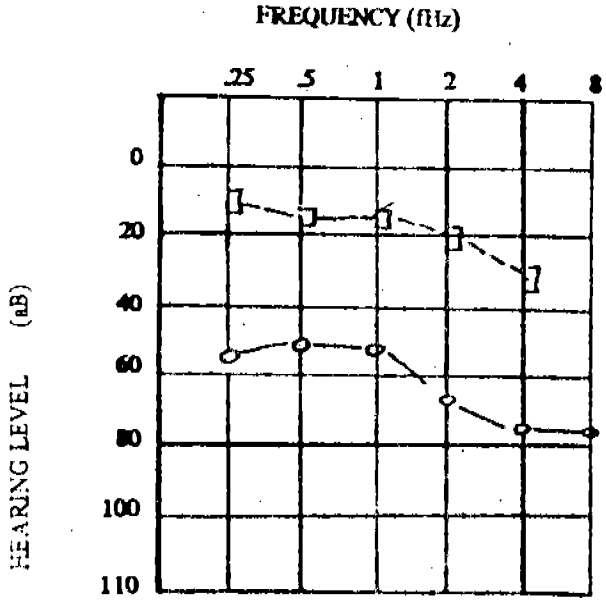

Fig. 4 Postoperative Audiogram

Review of the operative record of the only patient who had profound hearing loss in 53 cases under study revealed that in this operation, there was a cholesteatoma which has filled the antrum, enlarged to 3 times normal size, and invading the middle ear and eroding into the ossicles. There were also granulation tissue around the stapes and semicircular canals. During the operation, the granulation tissue around the stapes and semicircular canals were not removed. The postoperative course of the patient was unremarkable.

The development of profound or total hearing loss could have been the result of the disease or of the surgical procedure. Exposure of the membranous labyrinth by the cholesteatoma or the operation or by both could lead to serous or suppurative labyrinthitis and a markedly or totally deaf ear.

There had been a number of reasons postulated for the development of high-tone sensorineural hearing loss. Dawes states that a high tone perceptive deafness is sometimes incurred due to manipulations in the region of the round and oval windows leading to serofibrinous labyrinthitis. Paparella, on the other hand, commented that high frequency sensorineural hearing loss may occur postoperatively as a result of energy transfer to the inner ear from he use of high speed drills and manipulations of the ossicular chain.

Several authors have implicated chemicals and antibiotics applied to the middle ear, both in laboratory animals and in man, as possible causes of sensorineural hearing loss. Antiseptics, such as chlorhexidine, when used as a preparation of the ear prior to tympanoplasty have caused hearing loss. Morizono and Sikoro have

implicated ethanol and povidone-iodine as possible ototoxic chemicals in animals. Antiseptics could come in contact with the portals of the cochlea - the oval and round windows and damage the hair cells. With the addition of detergents as in povidone-iodine scrub, the ability of the antiseptic to diffuse through membranous tissue is presumed to be increased. Hence, the membranous cochlea could be adversely affected in the presence of surface-acting agents. Gelfoam, used abundantly as packing in tympanoplasties and as a stapes prosthesis, has been considered as a cause of occasional unexplained sensorineural hearing loss following such operations. Gelfoam has been postulated to release ototoxic formaldehyde during degradation. Topically used chloramphenicol has been shown to produce hearing loss in guinea pigs, cats and humans. Neomycin, polymixin, gentamycin, erythromycin, and tetracycline have been shown to result to vestibular and cochlear toxicity following middle ear applications in man.

The apparent predisposition of high-tone hearing to be affected could be explained by the fact that the portion of the cochlea toward the base is more likely being damaged most by manipulations in the region of the round and oval windows and the ossicular chain and the diffusion of chemicals and antibiotics through the round window.

The results of the study showed that sensorineural hearing loss after radical mastoidectomy is relatively uncommon, with an incidence of 9.4% in our series.

Considering the manipulations around the region of the oval and round windows and of the ossicular chian, the use of high-speed drills and the topical use of antibiotics and chemicals in the middle ear during radical mastoidectomy, then it would be expected that the incidence should have been higher.

In our study, the relative infrequency of this complication could have been due to several reasons.

First, it is believed by several authors that the proliferation of the mucosa in chronic otitis media protects by dampening the energy transmitted to the cochlea and by limiting the diffusion of drugs through the oval and round windows.

Second, the study utilized common aduiometric practice which limits testing above 4000 Hz using bone conduction. It is possible that sensorineural threshold could have been elevated in the higher frequencies but were not noted in the audiograms. In a study by Morizono and Sikoro, of ototoxic effect of topical povidone-iodine, they have shown progressive threshold elevation, with the higher frequencies of 8000 Hz and 12000 Hz affected to a greater degree.

Third, it is possible that the sensorineural hearing loss could have been manifested only after the four weeks postoperative period when the audiograms were done.

The possible causes of sensorineural hearing loss after tympanomastoidectomy should serve as a warning against avoidable iatrogenic deafness, although they could be considered uncommon. Clearly, the use of meticulous and extreme care when working in the area of the labyrinth can not be overemphasized. If trauma to the incus and malleus seems likely, then disarticulation of the incudostpaedial joint could be done. Ototoxic drugs applied topically should be carefully used in the middle ear, and avoided whenever possible.

Summary

Preoperative and four-week postoperative audiograms of 53 patients with cholesteatomatous otitis media who underwent radical mastoidectomy were studied. Five patients developed sensorineural hearing loss. One patient had profound hearing loss while four patients developed high-frequency sensorineural hearing loss. The possible causes of this complication is discussed. Although uncommon, sensorineural hearing loss after radical mastoidectomy could be minimized and, if possible, avoided, if meticulous care during surgery and judicious use of ototoxic drugs are done.

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CHRONIC TYMPANOMASTOIDITIS WITH CHOLESTEATOMA FORMATION: A FIVE-YEAR CLINICO-SURGICAL AND RADIOGRAPHIC CORRELATIVE STUDY *

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Teresa Wilma Cunanan, M.D. ***
Vergel Angelo Dijamco, M.D. ***

Introduction

In a crisis environment where the government-sponsored pre-need health insurance system (MEDICARE) is inadequate, the goal of total health care delivery almost always suffers. The increasing cost of medical and laboratory services as well as hospitalization will see to that.

Objective

As a cost-cutting measure, this study was undertaken in an attempt to discover any correlation between the clinico-surgical findings in chronically discharging ears and the radiographic reports of a cholesteatoma so that mastoid x-rays can be minimized or altogether dispensed with.

Materials and Methods

Records of 38 patients with chronic tympanomastoiditis admitted at the MCU Hospital over a 5-year period from July 1978 to June 1983 were studied. Pertinent data as to age, sex, presence of ear discharge, presence and location of tympanic membrane perforation, radiographic reports, surgical findings, and histopathologic diagnosis were tabulated. The following correlations were studied:

a) location of tympanic membrane perforation and incidence of cholesteatoma formation and other pathologies necessitating surgical intervention;

b) readiologic and surgical reports of cholesteatoma against subsequent confirmation by histopathologic examination; and

c) the possibility of surgery based primarily on clinical evaluation.

Results

Among the 38 cases studied, 14 were males and 24 females with ages ranging from 2 to 39 years. The mean age incidence was 14.9 years. All cases reviewed have chronic foul-smelling ear discharge. Significantly, 22 (57.9%) were histologically confirmed cholesteatomas (Diagram A). These developed in 4 out of 7 (57.1%) cases with marginal perforation, 1 out of 6 (16.6%) cases with central perforation, and 17 out of 22 (77.3%) cases with no report of a tympanic membrane perforation. None of the 3 cases with attic perforation developed a cholesteatoma (Diagram B & C).

Unfortunately, only 15 mastoid x-rays were available for analysis (Diagram D). Six (6) presented with radiographic evidences of a cholesteatoma while the remaining 9 were reported as 'mastoiditis' without mentioning the presence or absence of a cholesteatoma (Diagram E & Table 1). All 6 (100%) radiographically positive cases were eventually confirmed surgically and histopathologically (Table 2).

Of the 9 radiographically negative cases, 4 (44.4%) were reportedly cholesteatomatous on surgery. Of these, only 2 (50%) were proven histologically. Paradoxically, in the remaining 5 cases with no operative evidence of a cholesteatoma, 1 (20%) turned out to be positive on histologic confirmation (Table 3).

In the 23 cases with missing radiographic reports, 17 have operative findings of a cholesteatoma while only 11 (64.7%) were confirmed histologically. In addition, there were 2 (33.3%) confirmations among the 6 cases with no surgical reports of a cholesteatoma (Diagram F and Table 4-A & B).

Interpretation

1) A surgical ear can be evaluated clinically based on the presence of a chronic, foul-smelling ear discharge irrespective of the type of tympanic membrane perforation.

2) No interpretation can be made on the basis of the type of membrane perforation since 77.3% of cases made no mention of any tympanic membrane perforation which is most unlikely. A more accurate physical examination and recording should be emphasized.

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*2nd Prize 4th Residents Scientific Research Contest in Otolaryngology held on Oct. 12, 1984 at the Army-Navy Club

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3) Mastoid x-rays simply provide further evidence of a middle ear/mastoid pathology. They were shown to be 100% reliable only when there are positive reports of cholesteatoma formation. Ironically, cholesteatomas were found in 33.3% of the radiographically negative cases.

4) Cholesteatomas were confirmed in 70.4% of surgically positive cases. However, they were also noted in 27.3% of surgically negative cases.

5) Although there was a notable magnitude of radiologic and surgical misdiagnosis, the histologic reports revealed various pathologic changes that necessitate surgical intervention.

Discussion

By virtue of their intimate anatomic relations, long-standing infections of the middle ear almost always involve perforations of the tympanic membrane and changes in the mastoid air cells invariably resulting in malodorous drainage.[1,2,4,8] Most commonly, chronic tympanomastoiditis is associated with cholesteatoma of the acquired type.[1,8] This results from squamous epithelial invasion of the mastoid air cells by way of a tympanic membrane perforation.[2,5,6,7,9] (Rarely, congenital cholesteatomas develop as a result of 'entrapment' of epithelial cells behind an intact tympanic membrane.[3,8,10])

Tympanic perforations may be extremely small and difficult to visualize otoscopy, requiring a more thorough and meticulous examination.[1,5,8] This seems to collaborate much with our observation that a considerable number of histologically confirmed cholesteatomas occurred in cases with no mention of a drum perforation.

The radiographic differentiation of a cholesteatoma from a granulation tissue, another common sequela of chronic tympanomastoiditis, is faced with much technical difficulty.[12] Moreover, their identification could only at best provide further evidence of a mastoid pathology and does not in itself constitute a prerequisite to surgical intervention.[8]

Unfortunately, medical management is of little importance in the treatment of chronic tympanomastoiditis.[1,4,8] In view of its insidious progression and the possibility of intra- and extracranial complications, chronic tympanomastoiditis becomes an absolute indication to surgery.[1,4,5,8,9] To treat a surgical ear medically, and a medical ear surgically, is not only a serious mistake but can constitute a crime in itself![11]

Conclusion

Chronic tympanomastoiditis is a surgical cond
commonly associated with cholesteatoma formatic
high degree of accuracy can be attained on simple cli
evaluation of the character of otorrhea irrespecti
the location of the tympanic membrane perfora
Expensive radiographic studies of the mastoid ca
minimized or altogether dispensed with since they
only provide further evidence of an expected ma
pathology. This effects reduction in the cost of me
care without sacrificing quality. Cases were cited
reasons were given.

DIAGRAM A: INCIDENCE OF CHOLESTEATOMA IN 38 CASES STUDIED

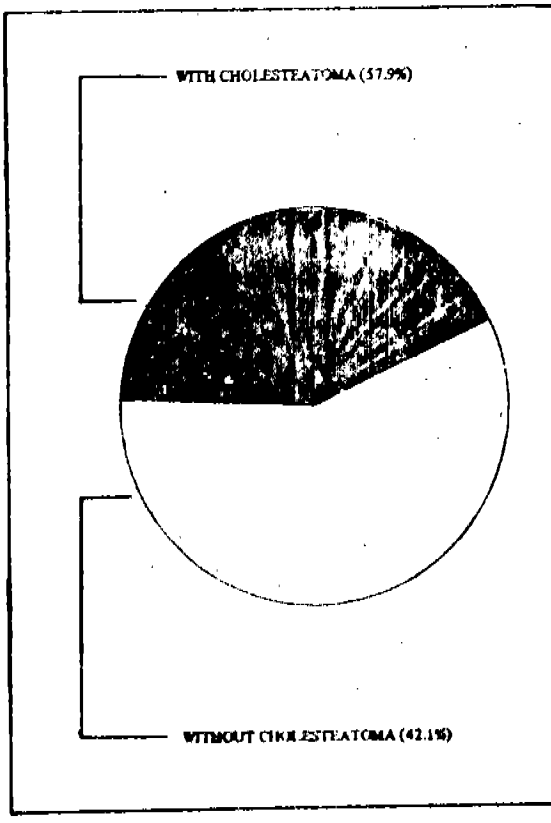


DIAGRAM D: DISTRIBUTION OF CASES WITH AND WITHOUT X-RAY REPORTS

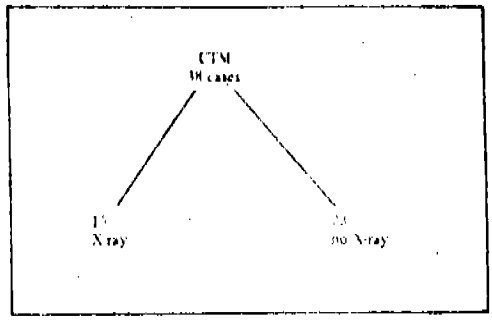
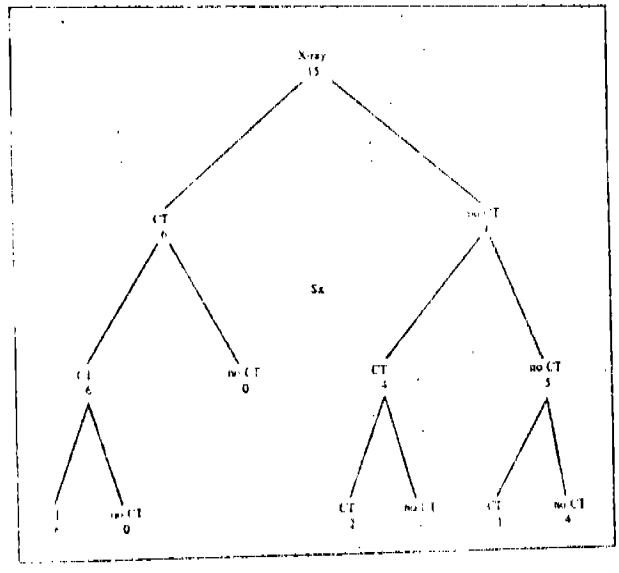


DIAGRAM E RADIOLOGIC, SURGICAL AND HISTOLOGIC REPORTS OF CHOLESTEATOMA IN CASES WITH X-RAY STUDIES

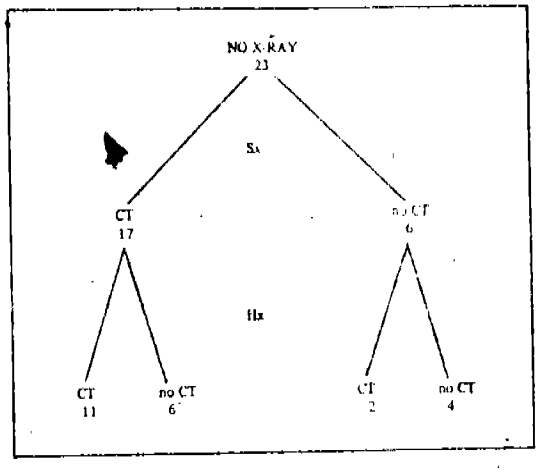


Legend

CT: cholesteatoma reported
no CT: no cholesteatoma reported

Sx: surgery
Hx: histopathology

DIAGRAM F. SURGICAL AND HISTOLOGIC REPORTS OF CHOLESTEATOMA IN CASES WITH MISSING X-RAY STUDIES



Legend:

CT: cholesteatoma reported
no CT: no cholesteatoma reported

Sx: surgery
Hx: histopathology

TABLE 1: RADIOLOGIC DIAGNOSIS IN 15 CASES WITH MASTOID X-RAY

A. RADIOGRAPHICALLY-POSITIVE

PATIENT NO	RADIOLOGIC DIAGNOSIS
9	Mastoiditis with cholesteatoma, left
12	Chronic tympanomastoiditis with suspicious cholesteatoma, right
15	Mastoiditis, left, with cholesteatoma
34	Chronic mastoiditis, bilateral, with suspicious cholesteatoma formation, left
35	Chronic mastoiditis, left with cholesteatoma
37	Chronic mastoiditis with suspicious cholesteatoma, right

B. RADIOGRAPHICALLY-NEGATIVE

PATIENT NO.	RADIOLOGIC DIAGNOSIS
1	Mastoiditis, left, with no evidence o cholesteatoma
5	Mastoiditis, right
10	Density over the right mastoid suggest ive of mastoiditis, right
14	Haziness over the right mastoid regio suggestive of mastoiditis
24	Bilateral mastoid infection more mark at the right with evidence of bon destruction
29	Chronic mastoiditis, left
31	Chronic mastoiditis, left
32	Chronic mastoiditis, right
38	Chronic mastoiditis, left

TABLE 2: SURGICAL AND HISTOPATHOLOGIC REPORTS OF RADIOGRAPHICALLY POSITIVE CASES

PT. NO.	SURGICAL REPORTS	HISTOLOGIC REPORT
9	CTM with cholesteatoma, left	Cholesteatoma
12	CTM with cholesteatoma and fistula formation, right	Cholesteatoma; acute inflammatory exudates; acute & chronic granulation tissue
15	CTM with cholesteatoma, left	Cholesteatoma
34	CTM, with cholesteatoma, left	Cholesteatoma, acute & chronic inflammation
35	CTM with cholesteatoma, left	Cholesteatoma, calcium fragments granulation tissue with dense inflammatory infiltrates and squamous surface lining epithelium
37	CTM with colesteatoma, draining fistula, and lateral sinus thrombosis	Cholesteatoma, acute inflammatory exudates and blood; osseous tissue

TABLE 3: SURGICAL AND HISTOPATHOLOGIC REPORTS OF RADIOGRAPHICALLY NEGATIVE CASES

PT. NO.	SURIGCAL REPORT	HISTOLOGIC REPORT
1	CTM with CT, bilateral	Tissue segments with acute and chronic inflammation
5	CTM with granualation tissue formation, R	Chronic mastoiditis
10	CTM with granulation tissue formation, R	Soft tissue, mastoid, right, granulation tissue
14	CTM with CT, R	CT
24	CTM, CT, and perisinus abscess, R	Acute and chronic inflammation of the mastoid and labyrinth, CT
29	CTM with CT, L	CT, mastoid antrum
31	CTM, left	Chronic mastoiditis
32	CTM with CT, subperiosteal abscess, R	Acute suppurative inflammation, right mastoid
38	CTM with lateral sinus thrombosis	Chronic mastoiditis

Legend:

CTM : chronic tympanomastoiditis
CT : cholesteatoma
R : right
L : left

TABLE 4: SURGICAL AND HISTOPATHOLOGIC REPORTS OF CASES WITH MASTOID X-RAYS

A. SURGICALLY POSITVE CASES

PT. NO.	SURGICAL REPORT	HISTOLOGIC REPORT
2	CTM with CT, L	CT, granulation tissue with acute and chronic inflammation
4	CTM with CT, R	Acute and chronic inflammation
6	CTM with CT, L	CT, chronic mastoiditis, L
7	CTM with CT, R	CT
8	CTM with CT, L	Granulation tissue with acute and chronic inflammation
11	CTM with CT, R	CT
13	CTM with granulation tissue, R	Osseous segments
16	CTM with CT, R	CT, acute and chronic inflammation
17	CTM with CT, R	CT, acute and chronic granulation tissue, acute inflammatory exudates
20	CTM with CT, L	CT
22	CTM with CT and granulation tissue formation, R	Osseous tissue fragments
23	CTM with CT and granulation tissue formation, R	Stratified squamous epithelium, keratinizing, with severe chronic inflammatory changes
25	CTM with CT and subperiosteal abcess, L	Acute and chronic mastoiditis
28	CTM with CT and granulation tissue formation, L	CT, acute and chronic granulation tissue
30	CTM wtih CT, R	CT
33	CTM with CT, L	CT
36	CTM with CT, L	CT

Legend:

CTM : chronic tympanomastoiditis
CT : cholesteatoma
R : right
L : left

TABLE 4: SURIGCAL AND HISTOPATHOLOGIC REPORTS OF CASES WITH MASTOID X-RAYS (continued)

B. SURGICALLY NEGATIVE CASES

PT. NO.	SURGICAL REPORT	HISTOLOGIC REPORT
3	CTM with granulation tissue formation, R	Acute and chronic inflammation, R mastoid
18	CTM with fistula formation and facial nerve paralysis, L	CT, acute suppurative inflammation, L
19	CTM, sclerotic, R	CTM
21	CTM with granulation tissue formation, L	CT, granulation tissue, acute and chronic inflammation
26	CTM with fistula formation, L	Acute and chronic inflammation
27	CTM with lateral sinus thrombosis	Chronic mastoiditis

Legend:

CTM : chronic mastoiditis
CT : cholesteatoma
R : right
L : left

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BROMHEXINE HCL IN THE CONSERVATIVE MANAGEMENT OF OTITIS MEDIA WITH EFFUSION*

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Natividad A. Almazan-Aguilar, M.D.**

I. INTRODUCTION

Otitis media with effusion (OME), a common ear ailment especially in children, which is characterized by accumulation of fluid in the middle ear is still nowadays a major therapeutic problem. Although most otologists are agreed that initial medical management is generally warranted, the question as to what constitutes appropriate medical therapeutic regimen is yet unsettled. This controversy stems from the fact that the multifactorial etiology of otitis media often results in the confusion as to which among them is the most prevalent one. Thus, various forms of medical treatment have been proposed by various investigators.

Whether the cause of effusion is infectious or not, it seems obvious that good clearance of the middle ear effusion through the eustachian tube is a favorable factor in the effective treatment of OME. Theoretically, reducing the viscosity of the fluid should lead to better effusion clearance from the middle ear cavity. In this regard, a mucolytic such as Bromhexine HCl may result in a more effective medical treatment of OME. Hence in this study we would like to compare the effectivity of decongestant antihistamine/Bromhexine combination to the more popularly used decongestant/antihistamine/antibiotic combination.

II. Materials and Methods

Twenty patients with OME seen at the Department of ENT UP-PGH from January to July 1984 were included in the study. A complete history and physical examination was made. Baseline pure tone audiometry and impedance tympanometry were also done on these patients. These patients were randomly divided into two groups, A and B, consisting of ten patients each. The first group (A) was given an antihistamine/decongestant, Triprolidine-pseudoephedrine for seven days plus Bromhexine HCl for a minimum of two weeks. (Adult dose: 1 tablet TID, pediatric dose: 1 teaspoon TID). The second group (B) was also given the same antihistamine/decongestant plus an antibiotic, Ampicillin which was given for 14 days at 100 mg/kgBW per day.

Patients were asked to follow-up every two weeks. They were reevaluated in a double-blind fashion with regards clinical symptom of hearing loss, otoscopic findings and tympanometric studies. These were repeated after another two weeks and one month thereafter.

Treatment success was recorded as resolution of signs and symptoms and improvement of tympanogram from Type B to Type A or Type C.

Cross-over was done to failures in each group after one month of treatment and follow-up.

For statistical analysis, the Z Test for proportions to determine significant differences between the two groups (A and B) in terms of the 2 parameters was used.

III. Results:

Of the 20 patients with otitis media with effusion (OME), 12 (60%) are females and 8 (40%) are males. 8 were adult and 12 were children (ranging from 4-15 years of age).

The patients were randomly distributed to Group A and Group B with 10 patients each. However, 1 patient in Group A and 5 patients in Group B were excluded because of failure to follow-up. Eight patients have bilateral OME and 6 with unilateral ear involvement. Thus, a total of 22 ears were included in the study.

All ears were evaluated based on tympanometric examinations and clinical symptoms.

Initial tympanogram on all ears showed Type B tympanometric examination. Repeat tympanogram after 2 weeks and later after 4 weeks were evaluated.

Group A which included 9 patients: 6 (66.6%) with bilateral ear involvement and 3 (33.3%) with unilateral OME, has a total of 15 ears. After 2 weeks, 3 (20%) ears improved to Type A tympanogram and 1 (6.66%) with Type C. On the 4th week, a total of 9 (60%) ears have improved, 8 (53%) to Type A and 1 (6.66%) to Type C and 6 (40%) remained Type B.

Table and Fig. 1

Group A: TYMPANOGRAM

	Initial	2 weeks	4 weeks
TYPE A	–	3(20%)	8(53%)
TYPE B	15(100%)	11(73%)	6(40%)
TYPE C	–	1(7%)	1(7%)

*3rd Prize.
**Formerly Senior Resident, Dept. of Otolaryngology, U.P.-P.G.H. Health Sciences Center
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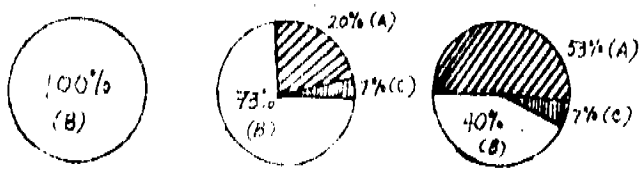


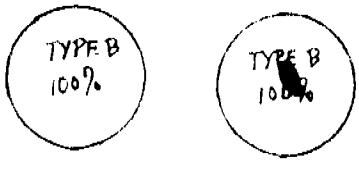
red shade – Type A
blue shade – Type C
white – Type B

Group B consisted of 5 patients, 7 ears, 2 bilateral and 1 unilateral. After 2 weeks, all (100%) ears remained Type B. After 4 weeks, only 3 ears followed up. All Tympanogram remained Type B. 3 patients (4 ears) failed to follow-up on the 4th week so no evaluation could be made.

Table and Fig. 2

Group B. TYMPANOGRAM

	Initial	2 weeks	4 weeks
TYPE A			
TYPE B	7(100%)	7(100%)	3(43%) (4 lost to follow-up)
TYPE C			



LTF – lost to follow up

Statistical results showed that after the 4th week of treatment, there was a greater proportion of patients in Group A than in Group B that showed signs of improvement in tympanometry. ($z = 2.75$, $p < .01$)

Of the 6 patients with bilateral affliction, 2 had bilateral improvement, 2 had unilateral improvement and 2 did not improve at all. (Group A)

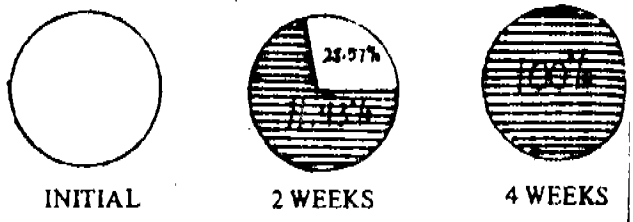
Clinical symptoms were evaluated based on subjective improvement of hearing.

In Group A, 14(93.33%) have hearing loss on initial evaluation. After 2 weeks, 10(71.43%) ears improved and after 2 weeks more, all 14 patients (100%) have no more hearing loss.

Table and Fig. 1

Group A: HEARING IMPROVEMENT

2 weeks – 10 (71.43%)
4 weeks – 14 (100%)



INITIAL 2 WEEKS 4 WEEKS

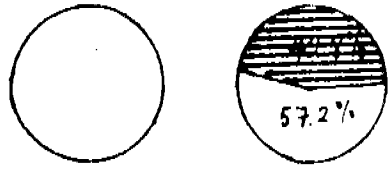
red shade – improve
white – unimproved

In Group B, all the ears have hearing loss on initial evaluation. After 2 weeks, 3 ears followed-up, all improved.

Table and Fig. 2

Group B: HEARING IMPROVEMENT

2 weeks – 3 (42.8%)
4 weeks – 3 (42.9%)



INITIAL 2 WEEKS

red shade – improve
white – unimproved

In both Group A and B, there was improvement of hearing in most ears even without change or improvement of the tympanogram from Type B to Type A.

Cross-overs of failures of each 6/15(40%) in Group A and 3/7 (42.9%) in Group B were done after a month of treatment in each group, but unfortunately all were lost to follow-up.

Statistical results showed significant difference in the proportion of those who showed signs of improvement in hearing even after the 2nd week of treatment. A greater proportion ($z = 1.66$, $p < .05$) of patients in Group A showed signs of improvement.

After the 4th week of treatment, a much greater proportion of patients in Group A showed signs of improvement in hearing ($z = 3.22$, $p < .001$).

IV. Discussion and Conclusion

The use of oral decongestants with or without antihistamine and in combination with antibiotics in the treatment of OME has been widely discussed in foreign medical literature. Cantekin et al reported that in a survey of 1,687 otolaryngologists, 91% of those wh

responded considered antihistamine/decongestant efficacies for OME. Although conflicting studies on the use of this combination have been reported by some authors (Cantekin, Kelin). This still somehow remains a mainstay in the medical management of OME because of the decongestant effect in the respiratory mucosa and the significant decrease of glandular secretion brought about by the atropine like property of antihistamine. Since bacteria is believed to have a definite role in OME (Lim, 1980) combining an antibiotic (Ampicillin) to this regimen should give higher success rate as was reported by Moran et al. This combination was used for our Group b patients.

Our study showed that patients given ampicillin with antihistamine/decongestant combination had improvement of ear symptoms. There was no change however in tympanometric results. Although all the 3 (42.8%) patients who made follow-up after two weeks claimed hearing improvement, this was not borne out by their tympanogram. These results parallel that of Thomson (1980) who noted that penicillin treatment had no effect even on the healing of acute otitis media as evaluated by tympanogram nor on the subsequent development of secretory otitis media. These failures may be explained by the fact that although many investigators believe that bacteria has a definite role in the pathogenesis of OME, a number of these effusions are bacteriologically sterile and that the incidence of ampicillin resistant isolates is in fact higher than was previously reported. (Lim 1980, Shurin 1976, Smith 1976, Symoporelore 1976, Schwartz 1978). Furthermore it was reported that the effusion level of ampicillin is tenfold lower in secretory otitis media compared to the effusion levels obtained in acute otitis media (Lahikainen 1977, Lim 1980). Since most of our subjects might fall under the category of secretory otitis media the suboptimal levels of antibiotics as claimed by Lim might modify or lessen the infection but not completely eradicate it. This may explain the improvement of ear symptoms but not of the tympanogram results among the patients given ampicillin/antihistamine/decongestant combination.

On the other hand, those patients given Bromhexine/antihistamine/decongestant combination (Group A) showed significant improvement of both ear symptoms and tympanometric results. Although our subject population is small, it is nonetheless worthwhile to note that there is a statistically significant difference between the results of Group A and B. These results agree with that of Wing (1978) who reported a 90% success rate on the use of a mucolytic in conjunction with an antihistamine/decongestant combination in glue ears. Presumably, Bromhexine hydrochloride, which is reported to reduce the viscosity of mucus secretions in pulmonary diseases could also bring about the same beneficial effects on middle ear secretions. This is not surprising since the middle ear mucosa in OME compares with that of the upper respiratory tract as reported by Tos (1980) in a histologic study done in 60 patients. Since the middle ear effusion is essentially a mixture of exudate and mucus which becomes increasingly viscous, the antihistamine/decongestant combination has a synergistic effect. The secretion is decreased with the antihistamine/decongestant and this secretion is rendered less viscid through the action of mucolytic. The net effect is a secretion of low viscosity, greater patency of eustachian tube due to mucosal decongestion and better effusion clearance. Obviously this theory is borne out by the conversion of Type B tympanogram to Type A as noted in 53% of patients.

In conclusion, we can say that based on this study:

1. Ampicillin in combination with antihistamine/decongestant may alleviate the ear symptoms of otitis media with effusion. This does not assure us however of total effusion clearance nor of total eradication of the disease process.

2. Bromhexine in combination with antihistamine and decongestant equally alleviates the ear symptoms of OME. In addition, it restores middle ear compliance as shown by conversion of Type B tympanogram into Type A which is suggestive of better effusion clearance.

Because of the limitations of this study, however, such as scarcity of patients, absence of control group and poor patient compliance, we cannot conclusively say that Group A combination is definitely better over Group B combination. With all these limitations, we nevertheless feel that Bromhexine shows a promise in improving our medical therapeutic regimen for OME. Whether it would be better to combine it with antibiotic, as well as decongestant may itself be enough to treat OME would be interesting if this can be answered by further elaborate investigations.

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The Phil. Acad of Oto Rhino & Neck Surgery

INSECTS IN THE EAR CANAL: A SOLUTION TO A PROBLEM*

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Introduction

The external auditory canal is very sensitive to touch; the skin over the bony canal is thin, bleeds easily and forms subepithelial hematomas from minor trauma.[1] If an insect crawls inside, it can cause great distress and extreme pain if it bites or beats its wings.

Over a 3-year period, from July 1981 to July 1984, a total of 93 foreign bodies in the ear were encountered at the MCU Hospital both in the emergency room and in the ENT out-patient department, broken down as follows:

Table I: Foreign Bodies - Ear

TYPE		NUMBER
A.	Inanimate	
	Seed	10
	Cotton	5
	Plastic materials	8
	Metals	3
	Stones	9
	Miscellaneous (hair, rubber, match-stick garlic)	6
		41
B.	Animate	
	Cockroach	13
	Ant	9
	Tick	2
	Fly	1
	Mosquito	1
	Unclassified (Insect)	10
		36
C.	Unclassified	16
	TOTAL	93

Of this number, 44.08% were inanimate and 38.72% were animate foreign bodies. While inanimate objects seldom calls for immediate attention, the animate foreign bodies -- mostly insects -- are urgent emergencies for reasons already stated.

Bole's Fundamentals of Otolaryngology covered the entire subject of ear foreign bodies in one short paragraph and as far as animate objects are concerned, it was non informative except for one sentence devoted to wood ticks, which is hardly indigenous to the Philippines. On the other hand, De Weese and Saunders' Textbook of Otolaryngology contained 3 sentences in 2 short paragraphs about insects entering the external auditory canal emphasizing the importance of immobilizing and smothering the insect. Older textbooks suggest the use of chloroform to immobilize insects but this is hardly available locally even in drugstores.

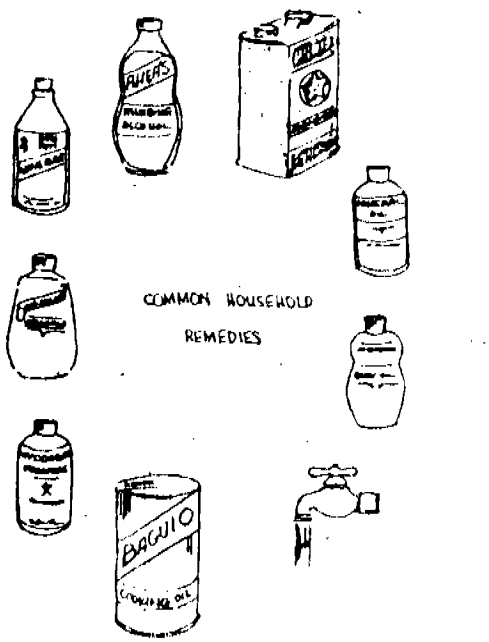
Objective

It is the purpose of this study to determine which among the common household remedies will rapidly kill insects without necessarily aggravating pain or cause any caloric effect and which can be used to immobilize or smother insects should they crawl and enter the ear canal.

For purposes of comparison, three medicate ear solutions were also included.

Materials and Methods

On the basis of ready availability, the following media were chosen: tap water, ordinary cooking oil, vinegar, kerosene, Vaseline Hair Tonic, hydrogen peroxide, alcohol, mineral oil and baby oil. The three commonly used otic drops tested were Lignosporin, Waxsol and Neosporin.



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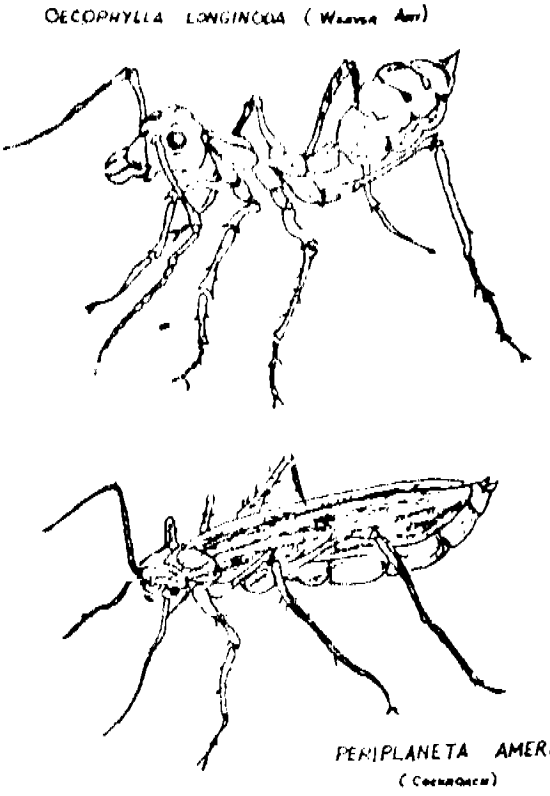

Cockroaches and ants – the two common ear canal intruders – were utilized for this investigation. Each specie was tested twice and the time it took to smother each was recorded and then averaged. The reaction of each insect to each medium was also observed and noted.

Ants are particularly interesting – not so much because it is an insect with no ears – but because once upset she attacks by biting with her powerful jaws (see pictures) and she also releases pheromones as well as sprays formic acid and other venom which adds to the discomfort of the victim.

Cockroaches, on the other hand, creatures that have survived for perhaps 350 million years – through all of nature's changes and all of man's attempts to eradicate them, are here to stay because of the insects' amazing ability to develop resistance to insecticides. Notwithstanding newer techniques – like using hydroprene which works by disrupting the roaches' reproductive system and thus acts as a sort of birth control – this insect has remained invincible.

An insect is considered smothered or suppressed the moment it becomes limped or motionless.

Results

As to smothering property, the following observations were noted. Of the different media selected, Vaseline Hair Tonic proved to be the most potent insect killer. Both cockroaches and ants were immobilized in less than half a minute (see Table II). This was followed by kerosene, alcohol, baby oil and cooking oil in the order of potency.

Hydrogen peroxide and tap water proved to be the worst smothering agents as both insects – ants and cockroaches – were observed to be alive after 10 minutes.

The otic drops – Lignosporin, Neosporin and Waxsol – took 2 to 3 minutes before each insect were completely immobilized.

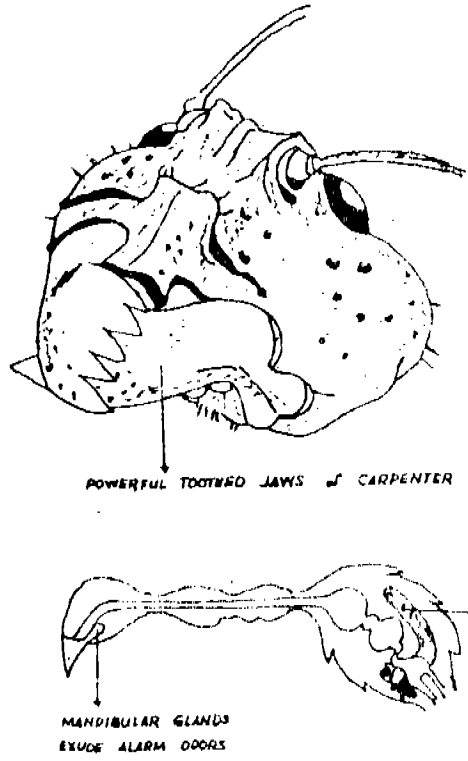

Table II: Smothering Time (in seconds)

MEDIA	COCKROACHES		
	Trial 1	Trial 2	Average
Cooking	24	28	26
Vinegar	44	97	70
Kerosene	21	20	20
Vaseline Hair Tonic	20	19	19
Alcohol	22	20	21
Mineral Oil	40	42	41
Baby Oil	20	25	22
Hydrogen Peroxide	Still alive after 600 seconds		
Tap water	Still alive after 600 seconds		
Lignosporin	80	84	82
Neosporin	178	170	174
Waxsol	150	100	125

Table II: Smothering Time (in seconds)

MEDIA		ANTS	
	Trial 1	Trial 2	Average
Cooking Oil	35	33	34
Vinegar	91	420	255.5
Kerosene	24	20	22
Vaseline Hair Tonic	25	31	28
Alcohol	38	32	35
Mineral Oil	40	44	42
Baby Oil	22	26	24
Hydrogen Peroxide	Still alive after 600 seconds		
Tap Water	Still alive after 600 seconds		
Lignosporin	92	53	72.5
Neosporin	185	145	165
Waxsol	148	79	113

Of the different media used, cockroaches appeared to have been extremely provoked by kerosene and alcohol. On the other hand, ants showed extreme provocation in vinegar, kerosene and alcohol (see Table III).

The caloric effect of each substance was not tested as it would entail testing a human subject for the purpose. But on the basis of volatility, alcohol and kerosene are expected to cause dysequilibrium or temporary loss of balance as one of them (alcohol) has actually been used for that purpose.

Table III Provocative Effect

MEDIA	COCKROACHES	ANTS
Cooking Oil	--	--
Vinegar	--	+
Kerosene	+	+
Alcohol	+	+
Vaseline Hair Tonic	-	-
Mineral Oil	-	-
Baby Oil	-	-
Hydrogen Peroxide	-	-
Tap Water	--	-
Lignosporin	-	-
Neosporin	-	--
Waxsol	--	--

Discussion

A good ear solution for suppressing or immobilizing animate foreign bodies in the external ear canal understandably should have the following criteria:

1. Readily available and cheap
2. Short smothering time
3. Cause no provocation
4. No caloric effect
5. Cause no irritation and other complications

From the results obtained, it would be noted that Vaseline Hair Tonic and baby oil are standouts. In an average of 19.5 seconds and 22.5 seconds respectively, cockroaches became limped and showed no gross life signs while the ants were immobilized after 28 seconds and 24 seconds respectively. Following them is cooking oil which immobilized the cockroaches in 26 seconds and the ants in 34 seconds. Furthermore, both insects were not provoked at all in any of the 3 media. Therefore, because of their short smothering time, in addition to their being readily available and having no effect on the vestibular apparatus, any one of the three would be a top choice for a household solution which can be used for this kind of an emergency.

Alcohol and kerosene have a killing time comparative to that of Vaseline Hair Tonic, but their provocative property, which could cause these insects to react violently by biting further, in addition to their caloric effect which is very distressing, eliminate them from the list of recommended ear solutions for this purpose. Water and hydrogen peroxide, on the other hand, should not be used as both media exhibited no smothering effect.

Therefore, when an insect is in the ear canal, an oily substance, such as baby oil, Vaseline Hair Tonic and cooking oil would be ideal to drop into the ear canal to suppress first the intruder. Afterwhich, it can be removed by gentle irrigation or with an appropriate forcep.

Comment

Extraction for animate foreign bodies from the ear canal carries a definite risk of additional trauma if the insect is not completely immobilized or disabled. If a difficult removal is attempted especially without anesthesia, the foreign body may be forced through the tympanic membrane into the middle ear, resulting in a conductive type of hearing loss and infection. Stenosis of the canal may also result following injury to the ear canal wall. For these reasons, it has been suggested that further attempts at removal without anesthesia be discontinued.[2]

Once anesthesia is considered, however, the patient need to be hospitalized thus increasing the cost of what initially appeared as a primary health care problem. In time of economic crisis, unnecessary hospitalization should be avoided. The use of common household remedies will make anesthesia and hospitalization unnecessary. Likewise, recourse to expensive otic solutions is also not needed as proven in this study, since all 3 otic drops tested failed to compare with the 3 common household items previously tested.

Summary

A study has been conducted to determine which among the common household remedies would be best suited to use as an eardrop in case an insect crawls into the ear canal. A total of 9 household items and 3 medicated otic drops were tested and the insects' responses noted and analyzed. Results revealed that an oily substance is best suited for this purpose.

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RETINOL AND TETRACYCLINE FOR ATROPHIC RHINITIS

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Introduction

Atropic rhinitis is still one of the most disturbing disease to the patient and a dilienma to the otolaryngologist. Many patients with atrophic rhinitis come to the otolaryngologist with the hope that a cure or a lasting relief can be obtained. But until today, no entirely satisfactory treatment has been developed. Frequent nasal irrigations and continuous care is only partially helpful. Surgical alternatives include implant operations to narrow the air passage but these were found to work only initially. The best suggested surgical procedure is a two-staged bilateral closure of the nostrils. However, experience on this is limited and the patient must suffer the discomfort of being a mouth breather during a three-year period of closure.

This study was designed to find a definitive management or a cure for atrophic rhinitis. The objective of this study is to determine the effectivity of retinol and tetracycline as a definitive treatment for atrophic rhinitis. We feel that we have taken one big thrust forward even if we can only just relieve the ozena and crusting for a prolonged period of time.

Materials and Methods

The subjects of this study were selected at random from the Philippine General Hospital Out-Patient Department based on the following criteria;

1. Patients diagnosed by physical examination to have atrophic rhinitis whether in the early stage or chronic stage
2. History of previous treatment with normal saline or sodium bicarbonate nasal irrigation.
3. Cooperative and promised to have regular follow-up.

Ten patients were included in this study. Their ages ranged from 17 to 58. All were females.

As a routine, we began with thorough cleansing of the nasal cavity by washing, suctioning and removal of crust. Retinol and tetracycline ointments were mixed at 1:1 proportion. The resultant mixture was liberally impregnated into sterile nasal strips. Both nasal cavities were then lightly packed. The patients were advised to come back after 5 days. On follow-up, the nasal packs were removed and the findings were recorded. The whole procedure was then repeated. For patients who could not tolerate nasal packings, daily swabbing using a cotton applicator was done. Treatment was discontinued when the nasal mucosa was found to be healthy looking upon examination or if no change in the fetid odor or crusting were obtained after four packings or an equivalent of 20 days treatment.

The following clinical data were recorded:

1. presence of ozena (fetid odor)
2. disappearance or persistence of crusting
3. change in color or fullness of the nasal mucosa
4. number of applicants
5. duration of treatment

The results were evaluated according to the following classification:

Excellent ..... absence of ozena
absence of crusting
– improvement in color and increase in fullness of the nasal mucosa and turbinates

Good ..... absence of ozena
absence of crusting
– no improvement in color and no increase in fullness of the nasal mucosa and turbinates

Fair-decrease ... of ozena
– decrease of crusting
– no improvement in color and no increase in fullness of the nasal mucosa and turbinates

Poor-no decrease of ozena
– no decrease of crusting
– no improvement in color and no increase in fullness of the nasal mucosa and turbinates

Discussion

Atrophic rhinitis in most cases is believed to be an end-stage of prolonged infection and as such, does not have a pathognomonic histopathology. No specific bacteria has been identified as the universal pathogen. The disease is characterized by a triad of atrophy, crusting and a fetid odor from the foul mucus.

Table I shows that most of our patients are in their third decade of life. All of them are females.

Table II shows that all of our patients complained

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of ozena. After treatment, ozena was relieved in 8 patients and diminished in 2.

All of our patients had crusting prior to treatment. Table III shows that after treatment, crusting was relieved in 8 and diminished in 2.

Table IV shows that of the ten patients, 7 showed improvement in size and color of the turbinates. The turbinates and the rest of the nasal mucosa remained pale, shiny pink and atrophic in 3 patients.

Table V enumerates the number of applications and the duration of treatment. Early or beginning atrophic rhinitis took 3 to 4 packings while chronic cases required 5 to 8 packings. In general, nasal packings required a much shorter duration of treatment than the swab. The longest time required for treatment using nasal packs was 40 days, while the longest time required for treatment using the swab was 56 days.

Table VI shows the results of treatment. Excellent and good results are noted in early or beginning atrophic rhinitis and for those chronic cases with adequate therapy. Two patients showed fair results. One refused further treatment while the other was lost to follow-up after the third packing. Our longest follow-up included two patients. One of them had recurrence of ozena after 11 months.

Aside from its role in the function of the retina, Vitamin A is essential for the integrity of epithelial cells. Vitamin A plays a major role in the induction and control of epithelial differentiation in the mucus-secreting or keratinizing tissue. In the presence of retinol, basal epithelial cells are stimulated to produce mucus.

Vitamin A taken orally is readily absorbed from the gastrointestinal tract. Significant quantities are also absorbed directly into the circulation. In the mucus epithelium of the upper respiratory tract, Vitamin A is likewise absorbed and especially when application is prolonged and sustained using nasal packs.

Oxytetracycline hydrochloride possesses a wide range of antimicrobial activity against gram-positive and gram-negative bacteria and also effective against some micro-organisms innately insensitive to many chemotherapeutic agents. Tetracycline is utilized in this study for the control of the chronic nasal infection.

If Vitamin D has a role in atrophic rhinitis, it is probably minimal. Vitamin D is concerned with the regulation of movements of calcium ions from both intestine and bone. Vitamin D., however, comes together with Vitamin A in a package readily available in the market.

Conclusion

Atrophic rhinitis is a condition which is of unusually very prolonged duration. The otolaryngologist is left in a quandary as far as its treatment is concerned. This study documents that tetracycline and retinol ointments can be used as a definitive treatment for atrophic rhinitis. Aside from occasional dislodgement of the nasal pack into the oropharynx, this procedure is relatively free of any complication. It is more acceptable, less invasive and definitely less expensive than the suggested surgical remedies, although it will require much of the patient's cooperation and determination for cure.

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A CLINICAL TRIAL OF A COMBINATION OF ERYTHROMYCIN ETHYLSUCCINATE AND SULFISOXAZOLE ACETYL IN BACTERIAL OTITIS MEDIA IN FILIPINO CHILDREN

Ricardo Fernandez, M.D.
Romerico C. David, M.D.

Introduction

Middle ear infection is one of the most common disease entity encountered by Otolaryngologists and Pediatricians alike (2). Normally, the middle ear compartment is considered sterile and its drainage is facilitated by a properly functioning eustachian tube (6). Infection within this area generally results from inadequate drainage with introduction of pathogens either through the eustachian tube (as in long standing URTI) or through a perforated eardrum.

Medical therapy is therefore directed at resolving infection with the use of appropriate antibiotics and by facilitating drainage of the middle ear with the use of decongestants, mucolytics, anti-inflammatory otic drops, and possibly with concomitant aural irrigation and suctioning. Failure of therapy primarily results from the wrong choice of antibiotic or inadequate drainage of the middle ear compartment.

The choice of appropriate antibiotic is dependent on the sensitivity of the organisms frequently encountered in infections of this nature. Since acute otitis media is most commonly due to Streptococcus pneumoniae, Hemophilus influenzae, and B-hemolytic streptococcus, ampicillin is necessary in penicillin sensitive patients and penicillin resistant cases (i.e. infections with B-lactamase producing organisms) (2). Erythromycin as an alternative drug of choice has met with some success because of its effectivity against common organism of URTI. The disadvantage is that being a macrolide, its efficacy is limited among gram (–) bacteria because of impermeability of their capsule to the drug (9). Theoretically, combining erythromycin with a drug effective against gram (–) bacteria will result in a broader spectrum of anti-bacterial activity. Pediazole, a new drug combination provides us with such a drug by combining erythromycin ethylsuccinate with sulfisoxazole acetyl. Studies have shown that the combined activity of its two components renders it as effective in acute otitis media as the single drug ampicillin, and more effective than the ingredients of the combination used separately (3). Pediazole has also been found to be active in-vitro as well as in vivo against Hemophilus influenzae resistant to ampicillin. (2)

Objectives

To establish the efficacy of a combination of erythromycin ethylsuccinate and sulfisoxazole acetyl (PEDIAZOLE) in the therapeutic management of bacterial otitis media in the pediatric age group by:

1. determining the clinical response after administration of erythromycin and sulfisoxazole.
2. determining the sensitivity of the organisms cultured from middle ear discharge to erythromycin and sulfisoxazole.

To establish the safety of the drug combination when administered in the prescribed dosage to Filipino children by:

1. determining the effects on the blood picture by comparing the complete blood count before and after therapy.
2. determining the presence or absence of any untoward reaction which may be attributable to the administration of the drug.

Materials and Methods

Choice of subjects

Thirty-five Filipino male/female children from one to twelve years old with bacterial otitis media with discharging ear, unilateral/bilateral, without surgical complication; example, attic perforation, cholesteatoma, aural polyp. Patient exclusion:

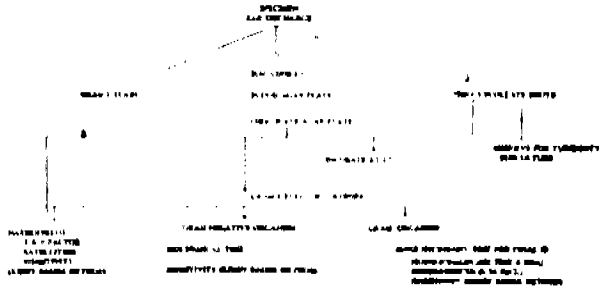
1. Known hypersensitivity to Sulfa/Erythromycin drugs.
2. History of any form of renal or hepatic function impairment.
3. History of allergy or bronchial asthma.
4. Known G-6-Phosphate dehydrogenase deficiency.
5. Patients with current ventilation tubes.
6. Patients with previous or current intake of antibiotics in the last week prior to the study.
7. Patients with complications needing surgical intervention e.g. cholesteatoma, aural polyp, subperiostal abscess.

Method

This is an open trial utilizing 35 Filipino males and females who satisfy the patient criteria as stated above.

Bacteriological studies were done by collecting ear discharges from the external auditory canal, or from the middle ear cavity as when the tympanic perforation is large enough to allow the suction tip or cotton swab into

the middle ear. The discharge is then examined utilizing the following steps:



Drug Treatment. The dose of Pediazole was calculated based on the erythromycin component (50 mg/kg/day), or the sulfisoxazole component (150 mg/kg/day) to a maximum of 6 gm/day. Pediazole was administered in equally divided doses four times daily for 10 days. It was administered without regard to meals.

The following approximate dosage schedule as recommended for Pediazole was followed for convenience:

Body Wt. in Kgs.	Dose every 6 hours
- 8	adjust to body weight
8 (18 lbs.)	½ tsp (2.b ml)
16 (35 lbs.)	1 tsp (5 ml)
24 (52 lbs.)	1½ tsp (7.b ml)
Over 45 (over 100 lbs.)	2 tsp (10 ml)

At the discretion of the investigator, local heat, local cold application, oral decongestants, analgesics for fever and/or pain, hydrogen peroxide irrigation, and in some cases, the use of topical antibiotic-steroid preparation were given in addition to the drug under study.

Clinical assessment. All the children underwent complete physical and especially, complete ENT examination prior to entry into the study. The following were done: CBC, Towne's view x-ray for the middle ear and mastoid bone, gram stain, culture and sensitivity studies of the ear discharges prior to start of Pediazole therapy. Repeat CBC was done after the 10-day therapeutic regimen to assess for any adverse effect of therapy on the blood picture. Patients were also followed up at 5 day intervals for repeat otoscopic examinations, aural irrigation and suctioning of ear discharge when necessary. Evaluation of morbidities such as rhinitis,, sinusitis, and tonsillopharyngitis were done along with a general assessment to note any adverse effects which may be attributable to the drug.

Results

Since in regard of degree of severity and prognostic criteria, the case material is non-uniform; subdivision into 3 groups is appropriate for proper assessment.

I. Acute Otitis Media – patients with middle ear discharge of less than 1 month duration with no previous history of ear discharge;

II. Acute Recurrent Otitis Media – patients with acute exacerbation of an inactive Chronic Otitis Media;

III. Subacute/Chronic Otitis Media – patients with middle ear discharge of more than 1 month duration.

Table I shows the relation between the type of response to Pediazole according to clinical type. As can be noted, there is a higher percentage of Fair-Good Clinical response in the Acute Otitis Media group (AOM) and Acute Recurrent Otitis Media group (AROM). There are 4/12 (33%) of Fair clinical response and 7/12 (58%) Good clinical response in the AOM group; while in the AROM group, 5/9 (55%) were Fair in response and 4/0 (44%) were Good in response to Pediazole. In the Chronic Persistent group, the Poor clinical responses were almost equal to the Fair and equal to the Good clinical responses.

Table I. Frequency Distribution of Response According to Type of Otitis Media

	Clinical Types	Clinical Responses Not Healed (Poor)	Improved (Fair)	Healed (Good)	Total No. of Cases
A.	Acute Otitis Meida Media	1	4	7	12
B.	Acute Recurrent	0	5	4	9
C.	Subacute/Chronic	5	4	5	14
	TOTAL				35

Staging of Clinical Response

Not Healed: Persistence of foul mucopurulent discharge with edematous or congested middle ear mucosa and tympanic membrane

Improved: Minimal non-foul smelling serous discharge with slightly edematous middle ear mucosa and tympanic membrane

Healed: Absent discharge with dry uncongested middle ear mucosa and tympanic membrane.

Table 2 shows the Pattern of Sensitivity of the Bacteria isolated to the individual components of Pediazole and to the combined antibiotic – Pediazole. Regardless of the clinical type of Otitis Media and bacteria isolated, it is observed that the sensitivity of the organisms to Pediazole equal to or even higher than the sensitivity to either drug if used alone. For example, an improved sensitivity was achieved for Staph. aureus in the AROM group where the organism is found to be 5/6 (83%) sensitive to Pediazole while if Erythromycin and Sulfisoxazole were used alone, only 3/6 of 4/6 organism would have been sensitive, respectively. For some organisms who are absolutely resistant to one of the components of Pediazole, they become susceptible to Pediazole if they are susceptible to other component

and this is the case for many of the isolated organism as shown in the table.

Table II: SENSITIVITY OF ISOLATED BACTERIA TO PEDIAZOLE

CLINICAL TYPES	BACTERIA ISOLATED	FREQUENCY OF ISOLATION	GRAM STAIN	SULFISOXAZOLE S	SULFISOXAZOLE R	ERYTHROMYCIN S	ERYTHROMYCIN R	PEDIAZOLE S	PEDIAZOLE R
ACUTE OTITIS MEDIA	P. aeroginosa	5	–	2	3	0	5	2	3
	S. aureus	3	+	1	2	3	0	3	0
	P. mirabilis	2	–	2	0	0	2	2	0
	L-hemolytic Strep	1	+	0	1	1	0	1	0
	E. coli	1	–	1	0	0	1	1	0
ACUTE RE-CURRENT OTITIS MEDIA	S. Aureus	6	+	4	2	3	3	5	1
	P. aeroginosa	3	–	1	2	0	3	1	2
	B-Hemolytic Strep	2	+	1	1	2	0	2	0
CHRONIC/ OTITIS MEDIA	P. aeroginosa	10	–	7	3	0	10	7	3
	S. aureus	1	+	1	0	1	0	1	0
	P. rettgeri	1	–	0	1	0	1	0	1
	P. vulgaris	1	–	1	0	0	1	1	0
	Klebsiella-Aerobacter	1	–	1	0	0	1	1	0

Table 3.

Clinical Types	No. of Cases	Types of Organism Isolated: Organisms	Types of Organism Isolated: Incidence	Percentage of sensitive organisms for each clinical group (Based on Table 2)	Percentage of healed cases (GOOD) Response	Percentage of cases with improvement (FAIR) Response
Acute Otitis Media	12	P. aeruginosa	5	75%	58%	33%
		S. aureus	3			
		P. mirabilis	2			
		a-hemolytic strep.	1			
		E. coli	1			
Acute Recurrent Otitis Media	9	S. aureus	6	72%	44%	56%
		P. aeruginosa	3			
		B-hemolytic strep.	2			
Chronic/Subacute Otitis Media	14	P. aeruginosa	10	73%	36%	29%
		S. aureus	1			
		P. mirabilis	1			
		P. rettgeri	1			
		P. vulgaris	1			
		Klebsiella	1			
		Aerobacter	1			

Table 3 shows the comparison of Actual Fair and Good Clinical response to the predicted response based on the sensitivity pattern of the organisms. Based on the sensitivity pattern of the organism isolated per clinical type, we are able to make predictions of the clinical response. For example, in the Acute Otitis Media group (AOM) the total percentage of sensitive organisms in the group is expected to be about 75%. In vivo we actually have about 33% fair clinical response while 58% have good clinical response to Pediazole therapy. The expected sensitivity of the organisms for the Acute Recurrent Otitis Media group (AROM) and Chronic/ Subacute Otitis Media group (CSOM) are almost the same as the AOM group. As far as the good clinical response is concerned, it can be noted that the percentage of Good clinical response is inversely related to the duration of the disease process; e.g. the more chronic the case, the less percentage of good response, thus while there is 58% Good clinical response in the AOM, there is only 44% and 36% Good Clinical response in the AROM and CPOM groups respectively. This ist he pattern observed regardless of the type of organisms isolated.

Discussion

The evaluation of antibiotic therapy for otitis media is difficult because of the high rate of spontaneous recovery. Heller evaluated 588 cases of otitis media and noted a spontaneous resolution in 50% of the cases (*1*). In a more recent study with a smaller number of patients, spontaneous resolution of otitis media was noted in 30% of the 280 cases studied (3). This, however, may not be the trend in the Filipino setting where malnutrition and poor hygiene are relatively more common. Another factor which may influence the prognosis of otitis media in Filipino children is the inaccessibility to prompt and adequate medical attention either because of financial constraints or just plain ignorance on the part of the parents. This explains the high incidence of chronic otitis media (frequently with complication) encountered in PGH. In this study, only 12 out of the 35 subjects examined were considered as acute cases while the rest were either recurrent or chronic otitis media. As can be seen in Table 1, the more acute the disease process, the higher the incidence of fair to good clinical response to Pediazole. In contrast, the chronic group has the highest incidence of poor clinical response. This observation points out, that the more acute the process, the more amenable to antibiotic therapy; whereas chronic otitis media with its build-up of granulation tissue and destruction of normal structures may necessitate a longer period of antibiotic regimen or even surgical intervention if complications develop.

In Table 2, we have the types of frequencies of bacteria isolated from the ear discharges and their corresponding sensitivities of erythromycin and sulfisoxazole. By computing the percentages of sensitive organisms isolated in each clinical group, it is possible to compare their sensitivities in vitro with the clinical responses in vivo. This is accomplished in Table 3 where we see that the correlation is inversely proportional to the chronicity of the disease. The incomplete correlation between the sensitivity test results and therapeutic efficacy in some of the patients in our study serves to remind us that, in addition to variations in drug absorption, there are multiple other factors operating in human infection which cannot be reproduced in vitro studies. The actual numbers of bacteria infecting the host tissues cannot be known and organisms isolated may be mere contaminants. The complexity of the tissue and body fluids which serve as growth medium in vivo cannot be accurately reproduced in vitro. The influence of the immune responses of the host cannot be introduced artificially. It is therefore apparent that antibiotic sensitivity studies as performed in hospital bacteriology laboratories, may not be entirely reliable in predicting efficacy of a therapeutic regimen in any given patient and must be interpreted merely as helpful hints.

Pharmacology

The antibacterial mode of action of Pediazole is based on the inhibition of bacterial protein synthesis by erythromycin on the one hand, and the competitive inhibition of bacterial synthesis of folic acid from para-aminobenzoic acid (PABA) by sulfisoxazole on the other. Previous preparations of sulfonamides involved various combinations with trimethoprim, a known inhibitor of dihydrofolic acid reductase, resulting in a sequential blocking of bacterial synthesis of purines and DNA (refer to diagram).

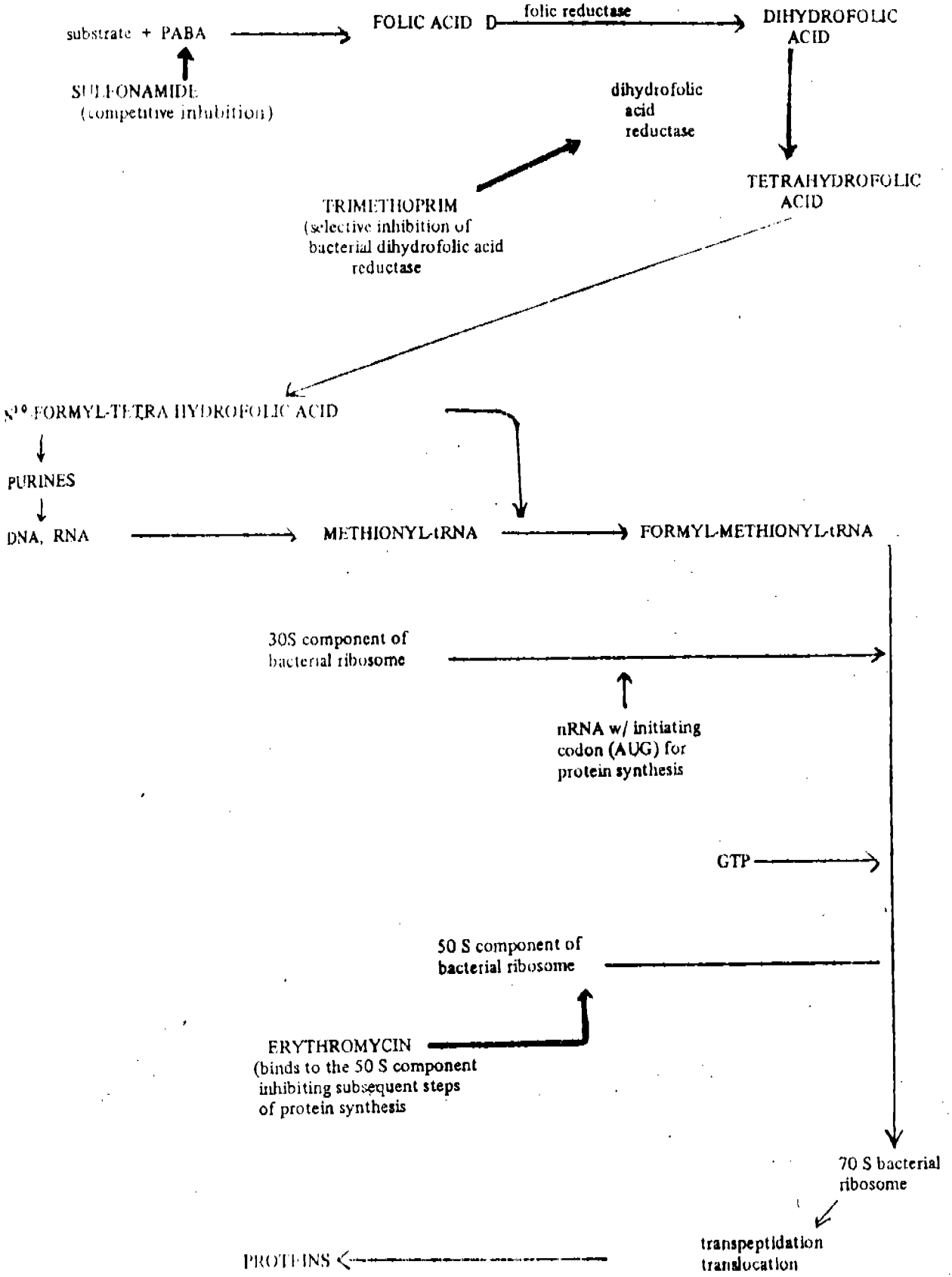
Certain bacteria however depend on exogenous sources of folic acid and are therefore resistant to sulfonamide mode of action. Furthermore, selectivity of trimethorpim to bacterial rather than mammalian dihydrofolic acid reductase is relative and not absolute.

TRIMETHORPIM CONCENTRATION (nM) FOR 50% INHIBITION OF DIHYDROFOLATE REDUCTASE FROM VARRIOUS SOURCES

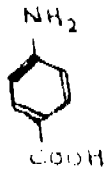
Mammalian (rat liver)	Baterial (E. coli)	Protozoal (P. berghei)
260,000	5	70

Preparations with trimethoprim should therefore be used with caution and may not be advisable for prolonged use in the pediatric age group.

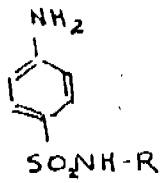
DIAGRAM OF THE METABOLIC STEPS WHICH ILLUSTRATE SITES OF ACTION OF SULFONAMIDES, TRIMETHOPRIM, AND ERYTHROMYCIN



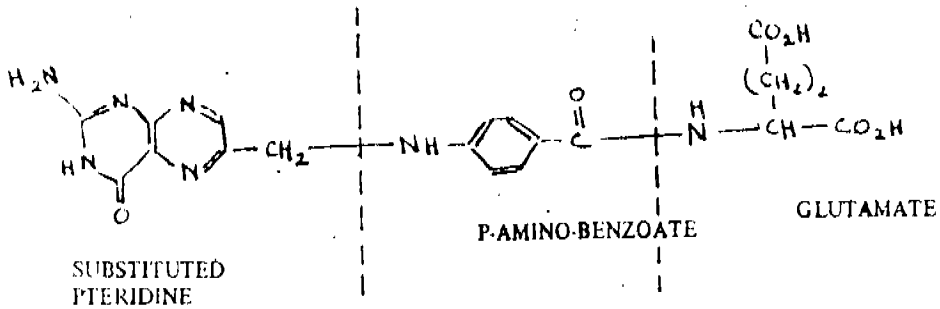
STRUCTURAL FORMULA



PARA AMINOBENZOIC ACID
(PABA)



BASIC RING STRUCTURE
OF SULFONAMIDE

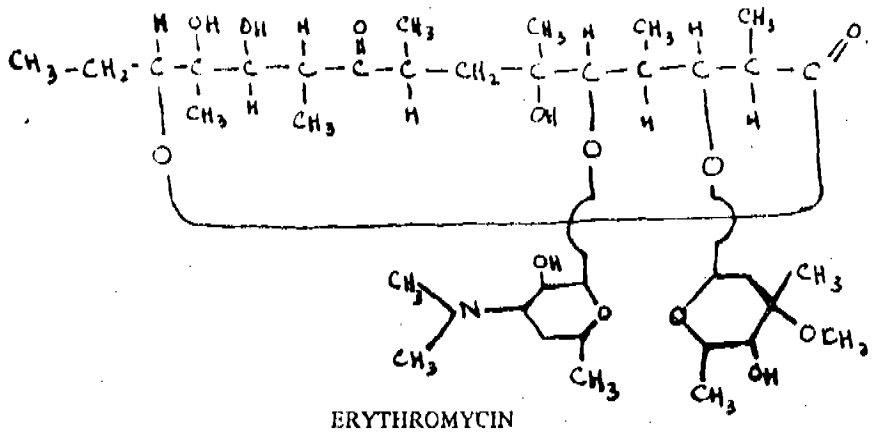


SUBSTITUTED
PTERIDINE

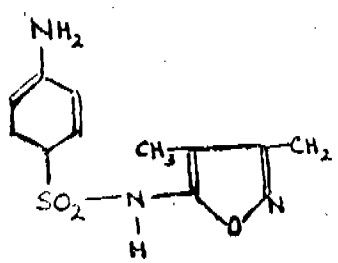
P-AMINO-BENZOATE

GLUTAMATE

FOLIC ACID



ERYTHROMYCIN



SULFISOXAZOLE

With the advent of Pediazole, a new drug combination with a broader spectrum of antibiotic activity is apparent. The combined action of inhibition of bacterial synthesis of protein and DNA in a single therapeutic regimen would favor the unlikelihood of the emergence of any resistant bacterial strains through mutation.

Both Erythromycin ethylsuccinate and Sulfisoxazole acetyl are readily absorbed in the GIT and have a very low incidence of untoward effects. Less than 0.1% of patients receiving Sulfisoxazole suffer serious toxic reactions (Yow, 1953). Because of its relatively high solubility in the urine, the risk of anuria and renal toxicity is low as compared to the older sulfonamides. Erythromycin ethylsuccinate on the other hand is concentrated in the liver and excreted in the active form in the bile. Hypersensitivity reactions are infrequent and disappear shortly after therapy is stopped.

Aside from their patient tolerability, both drugs complement each other in terms of bodily fluid distribution. Erythromycin diffuses readily into intracellular fluids. All tissues except the brain contain higher concentrations than in the blood, and the drug persists for some time in the tissues after it is no longer demonstrable in the circulation (serum half life 1.5 hours). Sulfisoxazole on the other hand is distributed mainly in the extracellular fluid compartment and its serum half life is 6 hours. (9, 10)

Conclusion

Evaluation of the clinical response of the 35 subjects indicates a good level of effectivity of Pediazole in the management of Bacterial Otitis Media specifically in acute processes. Significant reduction of associated morbidity such as rhinitis, sinusitis, pharyngitis, and tonsillitis is also noted after therapy.

Organisms cultured from middle ear discharge may not be representative of the true pathogens and further studies on isolation techniques may be indicated.

Evaluation of the toxicity of the drug combination indicates it is well tolerated among Filipino children. No adverse reactions were noted in any of the subjects and blood picture studies reveal only a slight decrease in WBC count which may be explained by the resolution after therapy.

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Scientific – Symposium

on

"INTERESTING CASES IN OTOLARYNGOLOGY"
held on August 24, 1984 at the
Hyatt Regency Hotel

The Phil. Jour of Oto. Head & Neck Surgery

TEARS FROM THE PAROTID*

Josefino G. Hernandez, M.D.**
Gil M. Vicente, M.D.**
Mariano Caparas, M.D.***

When the lacrimal gland is diseased or traumatized and consequently ceases its function of lubricating the eye, how will you as a doctor come to the rescue of your helpless patient?

Xerophthalmia or dry eye has been a troublesome disease since time immemorial. It is usually caused by trachoma, surgical injury or trauma to the lacrimal gland, Bell's palsy and 7th nerve paralysis.

Several methods have been suggested to prevent an eventual drying of the eyes. The ophthalmologists have used surgical blockage of the puncta lacrimalis, tarsorraphy and high doses of Vitamin A. But many recommend that their patients bathe their eyes using artificial tears.

All of these may be of help but they are largely limited, and hence unsuccessful in preventing the complications of total xerophthalmia.

Therefore, a more desirable method, we have always desired something natural, something which delivers adequate flow of secretion for lubrication and most of all, something which is physiologic.

Otolaryngologists have always been the ophthalmologist's partner. And in this kind of situation, our expert assistance is indeed needed.

We are presenting here patient, whom we offered this kind of help. He is G.F., 40, male, from Cebu City who seven years ago sustained injury in the eyes after muriatic acid was splashed over his face. He was rushed to a nearby hospital where copious washing with NSS was done. He was discharged with poor vision on the right eye and blurred vision on the left.

Patient developed entropion and this was operated on. There was no change in the vision until five years later, when the left eye got infected and unfortunately became totally blind. The right eye, however, still has light perception. And since this is the only functional eye, efforts were made to make it a bit more functional.

He was then scheduled for keratoplasty of the right eye. But prior to surgery, the ophthalmologist would want a constant source of tears to bathe the eye. Tear production has been absent in this patient because of damage to the lacrimal gland by the muriatic acid. If reconstruction were to succeed, then, something must be done to ensure lubrication of the eye. Methods mentioned above were evaluated but were later discarded since they were felt inadequate.

And so, he was referred to us to put an end to this predicament.

On admission, pertinent physical examination centered on the right eye wherein a conformer was noted. Cornea appeared keratinized and fornix was shallow. There were conjunctual adhesions noted. There was light perception on the right eye but on the left eye it was absent. There was likewise no tear production. The rest of ENT findings were grossly normal. There was no parotid swelling, no buccal mucosa lesion.

A natural and physiologic alternative to tears from the lacrimal gland is parotid secretion. The constituents of the two secretions which resemble each other and the proximity of the two glands are of great significance. Hence, we did Stensen's duct transposition to the conjuctival sac, patterned after that method done by James F. Bennett and Robert Chase. Under general anesthesia, the procedure done is described as follows:

I. **Location of the Parotid duct**
The course of the parotid duct run along a horizontal line from the ala of the nose to the ear lobule. A vertical line from the lateral canthus of the eye bisects the point where the parotid duct curves deep at the anterior border of the masseter muscle to enter the mouth opposite the second upper molar. This point of bisection between the vertical and horizontal lines was marked on the skin.

II. **Identification and Dilation of Stensen's Duct**
The punctum of the Stensen's duct was identified and dilated with a lacrimal probe.

III. **Insertion of the Polyethelene Tube**
No. 50 polyethelene tube was introduced into the parotid duct.

IV. **Harvesting of buccal mucosa along the direction of the parotid duct**
Parallel incisions approximately 1 to 2 cm. apart were made in the buccal mucosa from anterior to posterior in the direction of Stensen's duct orifice.

V. **Elevation and Tubing**
After this, the buccal mucosa flap elevated in

*1st Prize

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

the direction of Stensen's duct orifice, it was then tubed over the polyethelene previously inserted. This was done using multiple interrupted 5-0 dexon sutures.

VI. **Incision of skin of cheek**
At the mark previously made (Step I), a line was drawn transversely from anterior to posterior for a distance of two cm. in the place as the imaginary line from the ala of the nose to the ear lobule.

After the buccal mucosa was reached, the mouth was entered at the level of Stensen's duct orifice. Thus the external and internal incisions were joined.

VII. **Exteriorization of the Parotid Duct**
The parotid duct with the tube extension of the buccal mucosa was brought out through the cheek incision.

VIII. **Development of Subcutaneous Tunnel to the Infero-lateral cul-de-sac**
This was developed from the infero-lateral conjunctival cul-de-sac about 1 cm. from the lateral canthus through the cheek incision.

IX. **Parotid Duct Transfer**
A 3-0 black silk suture was placed at the distal tip of the parotid duct with its tube extension. Using a blunt curved clamp, this part was threaded through the subcutaneous tunnel to the inferior conjunctival cul-de-sac at the lateral canthus of the eye. This was sutured to the conjuctiva. Multiple interrupted ophthalmic 6-0 sutures were applied.

X. **Closure of Intraoral defect**
3-0 chromic catgut sutures was used

XI. **Polyethylene tubing anchored to skin**
Using 3-0 black silk sutures.

Bulky dressing was applied Patient was placed on antibiotics (Ampiclox - 500 mg QID). Chloroophthalmic ointment was applied three times a day. Daily cleaning of wound were done. Sutures were removed after 5 days. Polyethelene tube was removed one week after with clear secretion noted coming out of the orifice.

However, there were some problems encountered postoperatively.

First, there was the impending stenosis. After the P.E. tube was removed on the 7th day, the orifice was noted to be impinged by the conformer placed on the patient's eye. Hence, little secretion would come out from it. We have to reposition the conformer and reintroduce a polyethylene tube to maintain its patency.

Second, there was the development of an infection. By the 10th post-operative day, yellowish exudate was noted to come out of the cheek incision. Culture study of the discharge revealed no growth. Grain stain was also negative. We shifted to Dalacin and the infection was controlled. But the duct seemed to develop stenosis because of this infection. We have to reintroduce a longer polyethylene tube from the conjunctival sac opening into the duct and let it stay there to maintain its patency. This has solved the stenosis and the parotid secretion continued to come out to bathe the eye.

A third problem vocalized by the patient is the excessive secretion during meals. To solve this roblem, various authors have recommended sectioning of the tympanic plexus near the promontory of the middle ear and also sectioning of the chorda tympani. It is also suggested that forming a shunt between the conjunctiva and the maxillary antrum. However, we did not attempt to do these to our patient.

We referred back our patient to the ophthalmologists now with something to keep his eye wet. We have done our part, and the second big step to light now depends on the eye specialists. This made things a little brighter, a big first step in the darkness.

Discussion

This is a story of a man, one of whose problems was the lack of lubrication to his only functioning eye. His dilemma parallels that of somebody with trachoma or Bell's palsy or anybody with xerophthalmia. He wanted very much to see well but before sight is improved, there should be a preliminary procedure to be done. And so by doing a parotid duct transfer, the search for something natural, something physiologic and something adequate was accomplished.

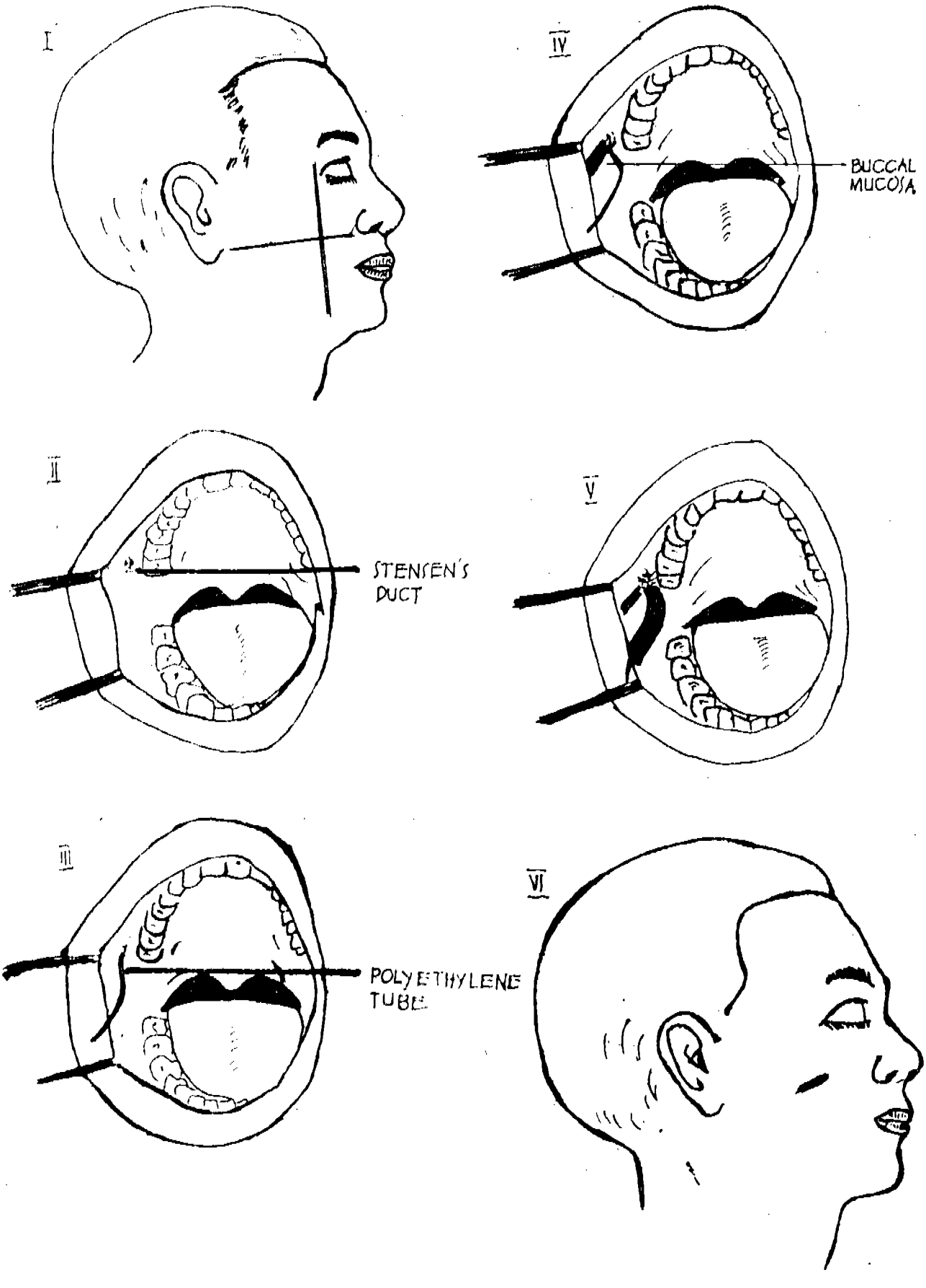
It is near physiologic because of the resemblance between lacrimal and parotid secretions. A physicochemical tabulation of the constituents of lacrimal and parotid secretions is presented. The pH, eletrolyte, total solid and osmotic concentrations are about the same. Both contain lysozyme and are transparent. The main difference is the presence of ptyalin in parotid secretion. Ptyalin is a digestive enzyme which has been known to cause no deleterious effect on the eye.

It is natural and hence no harmful chemical gets into your eyes, as when you use artificial tears. It is adequate because enough secretions are obtained day in and day out.

Pre-operative evaluation of patients undergoing this procedure include insuring a normal flow of saliva from the parotid gland.

Conclusion

The problem of xerophthalmia can now be hurdled by this simple technique of parotid duct transfer. The end result overcomes all the inadequacies previous techniques have shown. Patients with Bell's palsy or with facial nerve paralysis can be greatly helped. And about our patient, he is ready for a more promising surgery. But whether the next step will be successful or not, it is not what makes this significant. It is the fact that, to the patient, we have brought him nearer to light.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STENSEN'S DUCT
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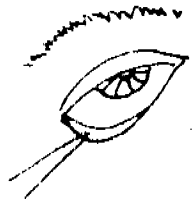
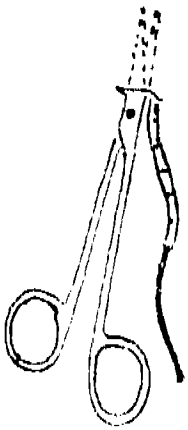
VII & VIII





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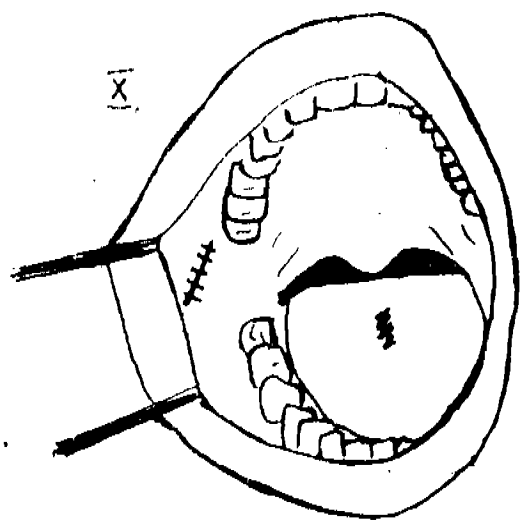
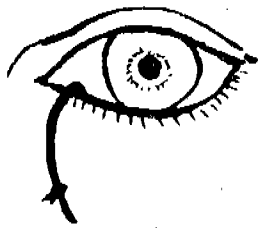


XI



12. The very first local case

13.

I. Location of the parotid duct

II. Identification and Dilation of Stensen's Duct

III. Insertion of the polyethylene tube

IV. Harvesting of buccal mucosa along the direction of the parotid duct

V. Elevation and Tubing

VI. Incision of skin of cheek

VII. Exteriorization of the Parotid Duct

VIII. Development of Subcutaneous Tunnel to the Infero-lateral cul-de-sac

IX. Parotid Duct Transfer

X. Closure of Intraoral Defect

XI. Polyethylene tubing anchored to skin

14. Bulky dressing applied
Antibiotics
Chloro Opthalmic Ointment
Daily Cleaning of wound
Sutures removed after 5 days
P-E tube removed after one week

The Phil. Jour of Oto-Head & Neck Surgery

AN ALTERNATIVE GLOTTIC RECONSTRUCTION FOLLOWING HEMILARYNGECTOMY*

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Introduction

In 1876 the first vertical hemilaryngectomy was performed by Billroth. Later, modifications were done by Gluck in 1912 and Hautant in 1930. Since then multitude of modifications were described in literature. In all these modifications the major problem was on the preservation of laryngeal function following the procedure. However, it should be emphasized that the extirpative procedure must not be compromised by the anticipated reconstruction.

A Case Report

In October 1983, a 62 years old, male, Filipino was admitted at UERM-H for an 11-month history of progressive hoarseness. There was no associated dysphagia. He had a smoking history of 20-pack years. Initial examination showed a left cordal lesion. There was no palpable neck node. Laryngogram showed supraglottic and subglottic extensions of the mass. Direct laryngoscopy revealed a 5mm. cauliflower-like growth involving the left anterior 1/3 of the true vocal cord with good cord mobility. Histopathologic examination revealed a well differentiated squamous cell carcinoma. A pre operative pulmonary fucntion test was done which showed normal results.

Intra-operatively, the lesion was noted to involve the membranous cord with 5mm. anterior infraglottic extension, so this was labeled as stage II (T2NOMO) laryngeal carcinoma. A fronto-lateral hemilaryngectomy was then contemplated. Laryngoplasty was done by utilizing the sternohyoid muscle to reline the resected area and to serve as a neo-cord.

Post-operatively, the patient was covered with Ampicillin and osteorized feeding at 1,800 cal/day was given for 2 weeks. Two weeks postoperatively, a direct laryngoscopy was done to assess the status of the "Neolarynx." The right true cord was mobile but the glottic chink was only 10mm wide. The neo-cord was noted to be edematous. On the 14th post-operative day, the patient was decannulated and was able to swallow clear liquids. The nasogastric tube was removed and the patient was started on soft diet. By then, he was able to perform maneuver such as valsalva and cough with limited phonation which improved upon discharge. Solids were likewise tolerated. On the 16th post-operative day the patient was discharge.

Operative Technique

A tracheostomy is done under local anesthesia and an endotracheal tube is inserted for purposes of general anesthesia.

A horizontal incision is made midway between the thyroid notch and the upper border of the cricoid cartilage. The incision is extended laterally on either sides to the anterior borders of the sternocleidomastoid muscle. A subplatysmal flap is raised to the level of the hyoid bone above and to the lower border of the cricoid below. The strap muscles are retracted laterally to expose the thyroid cartilage. A perichondrial flap is raised from a vertical incision made on the right hemithyroid 3mm beyond the midportion. The anterior edge of the flap is continued posteriorly up to 3mm from the posterior border of the left hemithyroid. An anterolateral pharyngotomy is performed on the side of the lesion and extended medially through the thyrohyoid membrane. A good view of the glottis and the cord lesion is obtained from above. With a Stryker saw, the laryngopharyngotomy is continued through the thyroid cartilage 3mm beyond the midline anteriorly, through the cricothyroid membrane inferiorly and 3mm from the posterior border of the thyroid ala on the involved side.

The excised specimen includes the left hemithyroid cartilage with a 3mm margin of the contralateral ala, arytenoid, left true vocal cord with 3mm margin of the contralateral cord, vocal process, false cord and a 5mm cuff of the cricoid cartilage. No resection is done on the epiglottis.

Laryngoplasty

To reconstruct the anterior commisure, the contralateral cord is fixed to the thyroid cartilage using 3-0 chromic catgut sutures. A single sternohyoid flap is used to serve as a Neo-cord. The muscle flap is severed from the hyoid superiorly. This is brought to the midline anteriorly through the incision in the thyroid perichondrium. With 3-0 chromic catgut sutures, it is sutured posteriorly to the previously resected arytenoic area and anteriorly to approximate the previously anchored vocal cord. A circumhyoid suture is placed on the loosened epiglottis. The hypopharyngeal pyriform sinus mucosa is approximated. No stents or molds are used. The tyrotomy is closed by approximating the cut anterior edge of the thyroid perichondrial flap. Likewise,

*2nd Prize

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the superior and inferior edges are also approximated to complete the reconstruction. Anesthesia is lightened to slightly awaken the patient. Endoscopy is done to assess the reconstructed larynx. The glottic chink was adequate and the right true vocal cord was mobile.

The reconstructive procedure is continued by approximating the strap muscles medially. The wound is closed in layers and an airway is insured via a tracheostomy tube. Penrose drains are inserted and exteriorized through the lateral aspect of the horizontal incision. Light compression bandages are applied.

Discussion

Adequate tumor removal and improved voice preservation were our primary goals in the choice of a surgicial procedure. Here, pre-operative evaluation and endoscopy were very essential. The choice of our surgical procedure has satisfied the 1982 indications for Hemilaryngectomy set by Mohr, et al. (Table I).

The five-year survival rates on 1061 cases of glottic carcinoma as reported by the American Joint Comittee for Cancer Staging, published in 1972, showed better results in favor with surgery. (Table II) In a separate report, Mohr et. al., showed promising survival rates in 57 cases of hemilaryngectomies done in T1 through T3 laryngeal carcinomas. (Table III). These reports strengthened our choice of Hemilaryngectomy as the surgical procedure of choice.

TABLE I

1982 Indications for Hemilaryngectomy

1. T1 lesions; especially for irradiation failures, irradiation refusals and early age of diagnosis (40 years old or less)
2. T2 glottic lesions (may have impaired cord mobility) with the following anatomic limits:
   a. to one third of the opposite cord
   b. to midventricle
   c. to 5mm subglottic extension posteriorly
   d. to 10mm subglottic extension anteriorly
   e. the entire hemithyroid cartilage to 1 cm beyond the midline and up to but not more than the upper one half of the ipsilateral cricoid
3. T3 glottic lesions with anatomic limits as above with fixation by bulk or muscle invasion, may be performed on irradiation failures.

TABLE II

Five-year Survival by 1972 TNM Classification: The American Joint Committee for Cancer Staging

	1061	cases of glottic origin
	522	cases of supraglottic origin
	19	cases of subglottic origin
	1	case of unknown origin
Total	1632	cases

TUMOR	RADIATION AND SURGICAL SALVAGE	SURGERY
	GLOTTIC	
T1	86%	65%
T2	55%	69%
T3	29%	55%
T4	14%	35%

TABLE III

57 cases of Laryngeal Carcinoma
All had Squamous cell carcinoma
All underwent hemilaryngectomy

25 T1 Lesions	: 3-,5-,10-year survival rate	= 100%
	: average survival in years	= 6.6
27 T2 Lesions	: 3-year adjusted survival rate	= 100%
	: 5-year rate	= 94.1%
	:10-year rate	= 84%
	: average survival in years	= 5.48
5 T3 Lesions	: 3-,5-,10-year adjusted survival rate	= 100%
	: average survival in years	= 8.4

The laryngoplasty done in this case is actually a modification of the procedure presented by Bailey in 1974. His procedure utilized a bipedicle sternohyoid muscle flap with a laryngeal stent. Ours used a full thickness sternohyoid muscle to reline the resected larynx and to create a neo-cord. The modified procedure was in effect simpler in that it only utilized a single pedicle muscle flap.

Comparison of the Bailey Procedure with the Modified Bailey Procedure

	Bailey Procedure	Modified Bailey Procedure
1.	Bipedicle sternohyoid muscle flap	1. Single pedicle sternohyoid muscle flap
2.	Laryngeal stent used	2. No stent used
3.	Midline thyrotomy	3. Hemithyrectomy
4.	Double vascular supply for the muscle flap	4. Single vascular supply for the muscle flap (inferior only)

	(superior and inferior)	
5	Mucosal lining for the flap	5. No mucosal lining
6	Limited resection	6. Wider resection

Advantages of the Modified Bailey Procedure over the Bailey Procedure

1. Simpler Procedure – no unnecessary splitting of the sternohyoid muscle
   no mucosal lining needed
   no stents required
2. Easy tailoring of the Neocord to fit the glottic defect
3. Gives more bulk to the reconstructed Neocord since it utilizes the full thickness sternohyoid muscle.
4. Theoretically, there is lesser bulk shrinkage of the Neocord after radiation therapy.
5. Injection of Teflon will be more successful because the Neocord is bulkier and denser.
6. Obviates the unnecessary manipulation of the hypopharyngeal-pyriform sinus mucosa, hence discouraging granulation tissue and cicatrix formation thus, preventing glottic stenosis.
7. Wider field of resection

One of the chief complication following vertical hemilaryngectomy is aspiration. This arises when there is inadequate replacement of the volume removed. Replacement can be done in several ways: Som has used pieces of thyroid cartilage in the area where the arytenoid was, but this shrinks considerably and is vulnerable to infection after a course of radiation therapy. Dedo has used free fat and fascia graft placed under a mucosal advancement flap, however, the major difficulty was on the estimation of the volume required especially since atrophy would occur. Our procedure used a full thickness sternohyoid muscle flap. This muscle graft has theoretically lesser bulk shrinkage properties compared to the loose cartilages and volume estimation wil not be much of a problem since atrophy is not very significant.

Summary

The initial success of this report on a modified laryngoplasty has showed technical simplicity and functional efficiency without compromise on tumor extirpation. Furthermore, the technique has maximized the postoperative laryngeal function in terms of satisfactory phonation, respiration and deglutition. Postoperative glottic stenosis and aspiration were not observed in the case reported. This paper does not end here, but this is the start of what might be another milestone in the annals of laryngology.

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AMELOBLASTOMA ARISING FROM A DENTIGEROUS CYST*

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Introduction

Ameloblastoma is by far the most common and most important of all odontogenic tumors.[1] Its invasiveness and high recurrence rate have influenced some authors to name it as a "histologically benign but clinically malignant" lesion. It may arise from the remnants of dental lamina, basal layer of oral mucous membrane, the enamel organ, and rarely, from a dentigerous cyst.

Batsakis[2] supports the same view, stating that it only rarely arises from a dentigerous cyst, despite reports to the contrary. It has been mentioned by Robinson and Martinez[3] that ameloblastoma arising from a dentigerous cyst is only defensible when it can be demonstrated that a non-neoplastic cyst existed prior to the appearance of ameloblastoma or when both the lining epithelium seen normally in odontogenic non-neoplastic cysts and ameloblastoma epithelium are present side by side.

We are presenting one such rare case, serving a notice that recurrent dentigerous cyst may indicate the presence of ameloblastoma warranting a more radical surgery for adequate treatment. Furthermore, serial sections of all tissues removed should be examined microscopically to get a correct diagnosis, and lastly, close and longer follow-up of patients who have undergone excision of dentigerous cysts should be emphasized.

Case Report

A fifteen-year-old female from Rosario, Batangas was admitted to the ENT department of UP-PGH on April 16, 1984 for the first time because of a right mandibular mass.

History and Present Illness. Five years PTA, the patient first noted a 1.5 x 1 x 1 cm on the right mandible, described as hard, fixed, non-tender and progressibly enlarging.

One and a half years PTA, the mass measured around 9 cm in its greatest diameter. She consulted at a private hospital where the mass was "excised en bloc" and read as "dentigeous cyst" on histopathologic report of the tissues, bones and molar tooth removed, based on the "dense fibrous connective tissue lined by non-keratinizing stratified squamous epithelium." She was discharged apparently well, but a month later, the mass recurred and gradually increased to about 6 cm in its widest diameter.

Thus, 10 months PTA, she was re-admitted in the same hospital where an "excision and curettage" of the mass was done. Histopathologic reading of the cyst capsule and bones taken during the operation showed "dentigerous cyst" and disclosed "dense fibrous connective tissue lined partly by single columnar epithelium and partly by metaplastic squamous epithelium." She was discharged without complications after 18 days, but about a month post-op, the mass recurred and rapidly grew in size, so she finally consulted at our OPD.

Physical Examination. Pertinent finding was a 12 x 10 x 6 cm right mandibular mass, fixed, non-tender with ping-pong ball consistency, bulging into the gingiva area and displacing the pre-molar and molar teeth medially.

Radiographic Examination. X-ray of the mandible showed a huge tissue mass density in the right hemi-mandible with absence of the body. There were incomplete septations in the peripheral portions of the right hemi-mandibular remnants. No abnormal calcifications were noted. Findings consistent with ameloblastoma.

Histopathology slides taken on the first two operations were secured from the first hospital and reviewed. A similar reading of "dentigerous cyst" was made by the pathologist.

The patient was presented at a Grand Rounds Conference and the general concensus reached was that the clinical course of the mass was more suggestive of ameloblastoma, thus a more readical surgical procedure was decided on, a right hemi-mandibulectomy with clavicular grafting.

Surgical Procedure. On May 31, 1984 the patient was brought to the operating table. The right mandible was removed and cut at the level of the right central incisor, getting a 1.5 cm margin of normal bone, and disarticulated at the temporo-mandibular joint. Portion of gingival mucosa was also obtained.

The surgical defect was repaired by harvesting the right clavicle via a supra-clavicular incision. The clavicle was disarticulated from the sternal end, and cut near the acromial end, measuring around 6 cm. After freeing the sternocleidomastoid muscle, the composite graft was swung upwards through the skin tunnel between the

*3rd Prize

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upper and lower incisions. The cartilagenous end of the clavicle was shaved off to expose the cancellous portion and wired to the mandible in a figure of eight fashion using a gauge 26 stainless steel wire, thus forming a free-floating myo-osseous graft. The muscular layer was wrapped around the bone, and closure in layers was done. Inter-dental and inter-maxillary fixation was placed. A nasogastric tube was inserted for feeding. Tube drains placed with a bulb asepto-syringe kept in constant negative pressure to suction secretions.

Gross findings revealed that the right hemi-mandible was enlarged from the level of the first pre-molar up to the condyle, measuring 12 x 8 x 6 cm, thin-shelled, with ping-pong ball consistency. The molar teeth were displaced medially. Another tooth was attached to the posterior aspect of the mass. On opening up, the mass was unilocular and contained a straw-colored, slightly mucous fluid. The inner aspect of the mass was smooth except for some fleshy inprowths attached to some areas of the wall.

Histopath report came out with a reading of "ameloblastoma, completely excised." A review and comparison of the previous slides taken during the first two operations again established a diagnosis of dentigerous cyst in the first two instances, but the pathologist noted a "focus of suspicious ameloblastic growth" in the second set of slides. In the latest histopathologic slides, a definitive picture of ameloblastoma was seen, coexistent with the characteristic epithelial lining of a dentigeous cyst.

Post-operative Course. It was satisfactory and uneventful. Intravenous penicillin and chloramphenicol were given, along with Flagyl suppositories given three times a day. The tube drains were removed after one week. She was discharged without complications a week later.

Close follow-up was done with the patient. Weekly check-up made sure the grafted clavicle was securely immobilized by the inter-dental and inter-maxillary fixation. This was removed along with the nasogastric tube after six weeks. No recurrence has been noted up to the present time, almost three months after surgery.

Discussion

We are presented here with a case of a young female who has undergone two previous excisions for a right mandibular mass. Histopath results of these two operations revealed dentigerous cyst. Clinically and radiographically, early ameloblastoma associated with an unerupted tooth may not be differentiated from a dentigerous cyst since it may be cystic, as stated by Batsakis, and on X-ray, it may be non-specific, except for the multilocular radiolucency which is very classical. With recurrences of the mass in our patient, ameloblastoma was highly considered because of the persistent behavior. Dentigerous cysts could not result in a rapid recurrence after an en bloc excision or complete enucleation. Ameloblastoma which has the capacity for continued growth is likely to have extensions beyond the visible margins of tumor and recurrence is highly probable if too conservative a surgery is attempted. Mehlisch et al reported the highest recurrence rate of 50% in patients who underwent conservative excision.

Our patient experienced two recurrences after removal of the lesion. Repeat radiographic examination revealed incomplete septations in the peripheral portion of the mandibular mass more suggestive of ameloblastoma than a dentigerous cyst. Emphasis is thus made here to have a closer and longer follow-up with patients diagnosed to have dentigeous cysts, since these may have an ameloblastic focus which could be missed or there could be proliferating enoplastic epithelial cells differentiating into ameloblastoma. Hutton[5] has reported a similar case of a fourteen-year-old female who underwent excision of a dentigeous cyst. Twenty-one months later, a radiolucent lesion reappeared. Ameloblastoma was entertained, and the patient underwent a more radical resection. Histopath result revealed ameloblastoma associated with a dentigeous cyst.

The apparent development of ameloblastoma in the wall of a dentigerous cyst was first described by Cahn in 1933. Other reports were recorded since then. Although some authors have stated that the rate of occurrence of this phenomenon is high, no accurate figures could be found. And in spite of the number of reports of ameloblastic change in the walls of dentigerous cyst, evidence were said to be somewhat equivocal. Lucas [6] has mentioned that in many reports, there was no definite evidence to show that the tumor developed from a simple cyst. Accepted evidence is when it can be demonstrated that the dentigerous cyst existed prior to the appearance of ameloblastoma, or when both the lining epithelium seen normally in odontogenic cyst and ameloblastoma epithelium are present side by side. Our case satisfies both of these. Furthermore, the histopathologic criteria for ameloblastoma set by Vickers and Gorlins[7] are met in our case, namely, the hyperchromatism of the basal cell nuclei of the epithelial lining of the cystic cavities, the palisading and polarization of the basal cell nuclei of the lining epithelium, and the presence of cytoplasmic vacuolization of the basal cells of the cystic lining.

In our case, the lining epithelium was observed to be continuous with that forming the ameloblastoma. This supports the theory that ameloblastoma arose by transformation of the epithelial lining of the cyst, which probably arises from the enamel organ after amelogenesis. This necessitates, therefore, complete removal of the dentigerous cyst during surgery. Serial section of the excised tumor should be done in the histopathologic examination in order not to miss the presence of the tumor.

Studies by McMillan and Smillie[8] showed that ameloblastoma associated with dentigerous cyst presents at an earlier age, six to fourteen years. Dentigerous cysts themselves are detected in the younger age group. This would support the concept that ameloblastoma can arise from the walls of dentigerous cyst, contrary to the

suggestion that such lesions are ameloblastomas which have undergone cystic degeneration with coalescence of small cysts to form a bigger one. If this is so, it would be reasonable to say that such lesions should appear in the age group of ameloblastoma in general, which is 39 years on the average and not in a younger age group.

Gardner[9] proposes that a number of important factors should be considered in planning the treatment of ameloblastoma. It is essential to distinguish among the three clinical types of ameloblastoma – the intraosseous solid or multicystic lesion, the well-circumscribed unicystic type (our case), and the rare peripheral or extra-osseous type – because they require different forms of treatment. For the solid or muticystic type, marginal resection with a 1 to 1.5 cm border of uninvolved bone is recommended. Segmental resection is done if the inferior border of the mandible is markedly thinned or expanded and involvement of the adjacent soft tissues is probable, as in our case. For the unicystic lesion with the tumor limited to the cystic wall or the lumen, enucleation produces complete removal. When the tumor has invaded the fibrous connective tissue wall, marginal resection should be done, after the initial enucleation. Peripheral ameloblastomas are excised with a small margin of normal tissue and the surgical site re-examined periodically.

Curettage produces a high risk of recurrence and deemed appropriate in highly selected cases only, like in the elderly, when it is desired to spare the patient of a more extensive surgery. Cauterization is more effective than curettage alone, and should be used as an auxillary treatment whenever curettage is employed to treat ameloblastoma. Radiotherapy is reserved for inoperable tumors. Dangers of post-radiation sarcoma and osteoradionecrosis have been mentioned by Becker and Pertl. Cryotheraphy has been discussed by Marciani in the treatment of ameloblastoma but presently warrants further studies as regards its effectiveness.

Conclusion

The case of a fifteen-year-old female with a recurrent mandibular mass is presented. Final histopath result was ameloblastoma associated with a dentigerous cyst. Excision of the mass and reconstruction were described. Diagnosis and the various forms of treatment were also presented.

To our knowledge, this is the first known locally documented report of ameloblastoma arising from a dentigerous cyst. We hope that this case would serve as a notice to otolaryngologists and physicians as well that ameloblastoma may arise from a dentigerous cyst, that recurrent dentigerous cyst may indicate the presence of ameloblastoma, and that a serial section of the lesion should be done and examined microscopically. Consequently, these would entail close consultation and communication with the attending pathologist, especially with persistent tumors like ameloblastoma which could easily be misdiagnosed and mis-treated otherwise. Not the least important would be the close follow-up examination of the patients who have had this kind of lesion removed. All these would be of great benefit to us in arriving at an early and proper diagnosis, providing an adequate treatment, and coming up with a correctly managed patient.

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PRE-OPERATIVE EMBOLIZATION IN JUVENILE NASOPHARYNGEAL ANGIOFIBROMA*

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Therapeutic embolization of juvenile angiofrioma was performed with lyodura and gelfoam in a 13-year-old boy who subsequently underwent surgery. Intraoperative blood loss was 1,700 ml. An angiographic protocol is suggested which is not primarily diagnostic but rather aimed: a) to identify the blood supply of the lesion and b) to permit preoperative devascularization by embolization with safety. No permanent complication occured; earache disappeared spontaneously within 24 hours.

Introduction

The clinical, radiologic and angiographic features of juvenile angiofibroma are well documented in medical literature.[1,3,13] Among the various methods of management of this tumor, surgery remains as the treatment of choice. The highly vascular nature of the angiofibroma, however, makes its removal one of the bloodiest procedures in head and neck surgery. Efforts to reduce blood loss have led to the use of various adjuncts in therapy including vessel ligation, cryotherapy, injection of sclerosing agents and oral diethylstilbestrol.

An attempt to reduce intraoperative bleeding with the use of preoperative embolization is here presented.

*Presented before the PSO-HNS on August 24, 1984 at the Hyatt Regency Hotel.

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Materials and Methods

With the patient under neuroleptanalgesia and local anesthesia, the embolization was performed by means of the transfemoral catheter technique. A polyethylene French 5 catheter was threaded into the external carotid artery under fluoroscopic guidance. After identification of the major feeding vessels, a superselective internal maxillary arteriogram was obtained. Small fragments of lyophilized dura and gelfoam (approximately 1-2 mm in diameter) were subsequently injected under the appropriate pressure, using saline as a bolus. Several pieces of gelfoam strips (1-2 mm x 15 mm) were utilized to occlude the proximal portion of the internal maxillary artery. The exact position of the catheter tip was always controlled before and after injection of the particulate embolic agents by a test injection of 2-3 ml. of contrast material.

Single-shot angiographs after each embolization were obtained to determine and document the reduction of blood flow ot the mass lesion. The procedure was terminated when significant reduction in the vascularity of the tumor and slowing down of blood flow in the main artery was observed. The same procedure was performed for the opposite external carotid artery.

Fluoroscopy and angiography were performed using a Televix GE 800 which has a fixed vertical x-ray tube. Films were taken on lateral projection using single shots.

The patient underwent operation 72 hours post-embolization.

Case Report

R.G., a 13-year-old male, was admitted on January 16, 1984 to the ENT Ward of the Philippine General Hospital for recurrent epistaxis and nasal obstruction. Three months prior to admission, he had developed increasing nasal obstruction associated with slight difficulty of swallowing, nasal speech, frequent coryza and snoring. He began to experience episodes of epistaxis on nose-blowing one month prior to admission.

On consultation at PGH, physical examination revealed bulging of the soft palate with a 3 x 3 cm. reddish fleshy mass in the nasopharynx. There was whitish nasal discharge and retraction of both tympanic membranes. The rest of the ENT findings were essentially normal. Radiologic examination revealed a soft tissue density at the area of the nasopharynx and haziness of the frontal and left maxillary sinuses.

Angiography and embolization were done three days before surgical removal of the mass. The left internal maxillary and ascending pharyngeal arteries were identified as the feeding vessels. The internal maxillary artery was embolized distally with lyophilized dura and gelfoam particles, then proximally with gelfoam strips. The ascending pharyngeal was not embolized due to technical difficulties. After embolization, pallor of the mass was noted. The patient also experienced moderate left ear pain associate with punctate hemorrhages

distributed over the left tympanic membrane. This pain gradually subsided and the hemorrhages eventually disappeared.

Intraoperatively, the mass was exposed via the Modified Ruddy Incision. The pedicle of the mass was noted to be attached to the left superoposterior nasopharynx and left terminal end of the septum. Excision of the mass was done and the pedicle removed piecemeal. The remaining stump was also fulgurated with electrocautery. The nasal mucosa and palate were sutured in layers, then anterior and posterior nasal packing were done. Blood loss was 1,700 ml.

The final specimen obtained measured 3 x 3 x 2.3 cm. with pieces of tissue with an aggregate diameter of 1.0 cm. Grossly, it was noted to be ovoid, pale, smooth and firm. Histologic examination of the mass revealed angiofibroma.

Discussion

Preoperative therapeutic embolization of juvenile nasopharyngeal angiofibromas has been extensively utilized in Europe and the United States for the past decade. Its use in such cases was suggested by Djindjian[1,2] in 1975. The primary indication is the reduction of intra-operative blood loss.

Roberson, et al.,[3] in 1979 reported an estimated average preoperative blood loss of 800 ml. in a series of 12 embolized cases of nasopharyngeal angiofibromas against an average of 2,400 ml. blood loss in two of the above cases who had previously undergone excision of nasopharyngeal angiofibromas without preoperative embolization. Fletcher, et al.[2] and other studies published abroad and their impressive results asre summarized in Table 1. Lasjaunias, et al.[6] in 1980 reviewed one of the biggest series ever published wherein 53 cases of juvenile angiofibroma were embolized with dura mater or gelfoam or both. This publication reported preoperative blood loss of less than 1 liter in 90% of cases. By comparison, blood loss in non-embolized cases (Table 2) was greater.

Table 1

Blood Loss in Embolized Cases

Source, Year	No. of Cases	Average Blood (Loss (ml)
Fletcher et al, 1975	7	1,177
Roberson et al, 1979	12	800
Waldman et al, 1981	10	775
UP-PGH, 1984	1	1,700

Table 2

Blood Loss in Non-embolized Cases

Source, Year	No. of Cases	Average Blood (Loss (ml)
Conley et al., 1968	34	1,850
Jafek et al., 1973	34	2,700
Christiansen et al., 1974	29	1,700
Ward et al., 1974	12	1,300
Fletcher et al., 1975	16	2,387
Roberson et al., 1979	2	2,400
UP-PGH, 1979-1983	11	3,500

At the Department of ENT, UP-PGH, 11 cases of juvenile nasopharyngeal angiofibroma managed surgically without embolization from 1979 to 1983 were reviewed. The average intraoperative blood loss is 3,500 ml.

In our patient, the intraoperative blood loss was 1,700 ml. The first 700 ml was lost during palatal incision and exposure of the mass and the surgical field. Other technical factors such as use of a surgical blade instead of cutting electrocautery during the transpalatal incision and non-infiltration of the palate with adrenaline which is a potent vasoconstrictor otherwise routinely utilized in similar cases could have contributed to the blood loss. Radiologic limitation under the present PGH set-up unfortunately inhibited further embolization of other possible feeding vessels from the external carotid artery i.e. ascending pharyngeal artery, left.

The dreaded complication of reflux of the emboli into the cerebral circulation or inadvertent direct injection of emboli into the internal carotid artery must be prevented. To avoid such risk, the catheter tip should be placed superselectively into the distal feeding artery without obstructing its flow. Throughout the procedure, test injections with contrast material are effected to control the proper position of the catheter tip. Ideally, horizontal beam fluoroscopy is important to avoid rotation of the neck of the patient that may cause displacement of the catheter. Recognition of aberrant internal-external carotid vascular anastomosis is also of prime importance. CNS complications remain a potential hazard when embolization techniques are not applied carefully. Roberson, et al., in their series did not have any neurologic complications. Conley[13] however stated that it could occur in 5% of cases. Other possible complications which are transient in nature and more commonly encountered are pain and low-grade fever attributed to tissue ischemia.

No permanent nor major complication attributed to embolization occured in our patient. Otoscopic examination prompted by clinical symptom of earache revealed punctate hemorrhages in the eardrum. The outer surface of the tympanic membrane is known to be supplied by the deep auricular branch of the internal maxillary artery which in our patient was possibly partly embolized distally. The hemorrhages spontaneous-

ly resolved within a week. Headache and earache were relieved by oral analgesics.

Conclusion

Transcatheter arterial embolization of the internal maxillary artery in our young male patient with juvenile nasopharyngeal angiofibroma proved to be useful preoperatively in controlling and limiting profuse bleeding during surgery. This allowed complete removal of the tumor. We feel that embolization is a safe and simple procedure in experienced hands which will, in the forseeable future, be of major benefit as angiofibromas. We hope local experience will grow and will continue to be encouraged and improved for the maximum benefit of our Filipino patients.

Acknowledgement: Dr. Roberto Reodica, Chairman, Dept. of Radiology and Cancer Institute, UP-PGH Medical Center.

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Pre-Operative Embolization in Juvenile Nasopharyngeal Angiofibroma

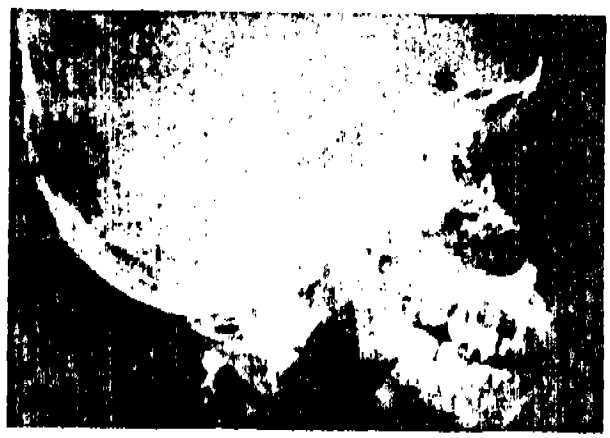

Fig 1. Plain film, lateral view reveals the presence of a soft tissue was density at the nasopharyngeal area.

Fig 2.

a. Pre-embolization angiography. Super-selective catheterization of the internal maxillary artery, left, shows a "tumor blush."

Fig 2.

b. Post-embolization angiography shows devascularization of the mass and occlusion of the internal maxillary artery with gelfoam strips.

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HEMANGIOMAS -- A SURGEON'S DILEMMA*

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Hemangiomas belong to the general group of Angiomas. They consist of dilated blood vessels with pools and collections of blood; and if it is superficial it is purplish in color but if it is deep it may present itself as a soft tissue mass, as a bleeding emergency, as a cause of respiratory distress, or as a marked deformity. If it presents itself as a bleeding emergency or as a cause of respiratory distress, action must be made decissively that deformity becomes immaterial as life takes priority. But if it appears as a soft tissue mass or as a deformity then the outcome of the treatment becomes real and important.

Hemangiomas that are present at birth are embryonic sequestration of the angioblast more often found in female. It could occur in any part of the body, even in the skeletal system. About 50% of all hemangiomas are found in the head and neck region.

Blackfield et al in 1960 gave a preliminary statistical report of visible hemangiomas. He classified them into involuting and noninvoluting. The involuting are the superficial, deep and combined While the non-involuting are the port-wine stains. In 1957, Blackfield et al examine 685 patients and many have multiple hemangiomas and 1 the lesions involuted spontaneously especially in infancy and childhood. However, there is no criteria by which to determine which one will regress.

With the knowledge of spontaneous regression and with some doubts on the efficacy of some forms of treatment, one is caught between the intense desire of the patient and pressure of the parents who cannot stand the look of the child especially if it is located in the face resulting from an imagined to actual deformity. If the lesion involuted, the smaller ones show no residual of the hemangioma, however, the larger lesions may result in wrinkles and bogginess of the skin such that surgery could not be avoided.

There are many treatments tried like radiaton, freezing, laser, for noninvoluting hemangiomas and surgery or the injection of sclerosing agents for deeper ones. Tattooing to match the color of the surroundings skin is done for capillary hemangiomas. Whatever technique is used care must be exercised that damage to normal tissue is minimal, to avoid excessive scarring or deformity worse than what is being corrected, especially if located in the face where it can produce distortion, assymetry or scarring.

Case History

A 13-year-old girl was admitted because of assymetry of the face.

Her condition started 3 years PTA as soft nontender mass in the left cheek. There were no accompanying nor aggravating symptoms. Several medications unknown to the patient were given with no improvement. The progressively enlarging mass caused marked assymetry of the face. The mass is compressible, becoming very prominent upon stooping especially when the head is pushed against resistance.

Physical examination showed a fairly developed, fairly nourished extremely shy girl, not in any form of distress, ambulatory, with vital signs all normal. There was a mass on the left cheek which was soft not well delineated, compressible non-tender, causing mark assymetry of the face.

Operative Technique

1. The polethylene tube was inserted into the Stensen's Duct to protect it from injury.
2. The line of incision was determined by asking the patient to make a grimace.
3. Incision of the skin down to the adipose tissue of the cheek was done exposing the hemangioma.
4. Major feeding vessels were exposed and ligated in continuity, with the minor feeding vessels likewise ligated.
5. The cavernous hemangioma was removed en toto, leaving the fat pad behind.
6. Plastic closure was done layer by layer making use of plain 3-0 in the subcutaneous layer and silk 5-0 in the skin.

Pathology

Microscopic section reveals large vascualr channels within loose fibrous tissue. Some of the vessels walls are thickened with thrombus formation within the lumens. No evidence of malignancy is seen in the section. Diagnosis is cavernous hemangioma with thrombus.

*Presented at the Scientific Meeting on Interesting Cases held on August 24, 1984 at the Hyatt Regency Hotel.

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Discussion

Cavernous hemangioma in the soft tissue are compressible however in the face it is also deforming and produces extreme consciousness and can cause an inferiority complex. It shows growth during puberty and pregnancy. In the soft tissue the usual order is spontaneous regression but there is criteria to know which one will be stationary, regress, completely involute, or continue to grow. The surgeon is placed in extreme pressure by the parents and patient. They should be made aware of spontaneous regression, and if the surgeon is forced to operate especially that of the large lesion it must be remembered that lesions which have undergone a few years of involution will be of help. Care should be made to place the incision following the lines of expression of the face and preserving the underlying important structures like the muscles, nerves and the parotid duct. Post operative feature is important in the choice of technique.

In the case presented the pathology report apparently indicated involution. During the operation care was made to preserve the underlying tissues and incision was alone the Langer's Line. Post operative day was uneventful. She was discharge after 5 days and stitches were removed at the 7th day. The patient was seen in two weeks after with hardly any evidence of the operation except for a faint thin line scar. The face is symetrical and there is no swelling on the left cheek she was asked to stoop and pushed her head against resistance. The result is satisfying to both the surgeon and the patient.

Conclusion

A brief review of hemangioma was made. The surgical technique with an illustration of a case was presented. Conservatism and extreme care in management must be exercise for soft tissue cavernous hemangioma.

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MODIFIED SAGITTAL OSTECTOMY OF THE MANDIBLE: A PRELIMINARY REPORT*

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Introduction

Sagittal ostectomy of the mandible is a relatively new, innovative surgical technique employed in operations within the oral cavity, more specifically for lesions situated or involving the floor of the mouth, the buccal mucosa, the lower lip, tongue, as well as the mandible itself. It is a modification of marginal resection of the mandible or the "pull through" procedure.[1] The difference lies in the boy cuts in that the sagittal ostectomy allows the full height of the medial, lingual cortex to be split from the lateral buccal cortex of the mandible.[1] Unfortunately, as described by Mazzarella and Freidlander, this procedure is not applicable to the ascending ramus of the lower mandible for anatomical reasons.

To ensure success, Mazzarelli and Freidlander insist that there must be at least one cm of grossly normal mucosa between the alveolar process and that the tumor has not infiltrated the periosteum as indicated by the mobility of the tumor in relation to the mandible.

At the Ospital Ng Maynila, Department of Otolaryngology, further modification of the procedure has been carried out. These modifications are even more conservative both in indication and extent, hopefully without jeopardizing the patient's chances for survival.

The modifications are as follows:

1. Tumor encroachment of the alveolar process is allowed provided there is no radiographic evidence of mandibular involvement.

2. Tumor infiltration of the periosteum is not considered as this is taken out anyway.

3. The mandible is completely resected and bone splitting done "in vitro."

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Case Reports

B. C., 43 years old with Squamous Cell Ca, floor of the mouth, left and R.E., 60 years old with Squamous Cell Ca, right buccal mucosa were both referred by the Santos Clinic in Malolos to the Ospital ng Maynila for definitive management. Betel nut chewers, pre-operative evaluation revealed tumor encroachment of the alveolar process in both cases with no radiographic evidence of bone involvement. Both patients were scheduled for surgery which included, among other things, a complete resection of the adjoining portion of the mandible with eventual replacement of the medial lingual cortex in the first (Ca, floor of mouth) and the lateral, buccal cortex in the second (Ca, buccal mucosa).

Discussion

In both cases, there was tumor involvement of the alveolar process without, however, any radiologic evidence of osseous destruction in the adjuacent mandible. Complete resection of the adjoining mandible was accomplished together with the primary lesion. The corresponding half -- either the medial, lingual half or the lateral, buccal half -- was removed together with the tumor. Working in vitro, the resected mandible is separated from the tumor taking care to avoid seeding. The resected portion of the mandible is thoroughly cleansed with Normal Saline Solution; all teeth were extracted and with the bone engine, the mandible was then split in half. The periosteum of the uninvolved half being left undisturbed and just before being placed into position, thoroughly cleansed again.

The uninvolved half was then replaced and wired back into position with its periosteum. Immobilization was reinforced by inter-maxillary wiring utilizing the uninvolved portions of the lower mandible.

Results

While it is too early to assess the long term results of this conservation surgery, nonetheless the more complicated reconstruction with osteomuscular flap consisting of the clavicle and sternocleidomastoid muscle with the use of the iliac crest, rib and the like are avoided, thus significantly reducing morbidity. If the tumor is completely excised, then in terms of physicologic function and cosmetic effect, this technique merits recognition and application.

Advantages:

1. No rejection or tissue reaction
2. Better cosmetic effect
3. Uncomplicated and easy
4. Increased accessibility to tumor

Comment

This innovation is not meant to downgrade progress already made in this field, most especially the use of compound flap of clavicle and sternocleidomastoid muscle. However, it is not as simple as it seems as it is an involved procedure which restores the function of

mastification, articulation, deglutition as well as the appearance of fullness and outline of the lower face.[2]

Even if sagittal osteotomy should fail, resort can be made to the osteomuscular flap technique as the replaced half of the mandible could be resected again.

Furthermore, it must be stated that periosteum is a natural barrier to tumor spread. During embryonic and post-natal growth, the inner lining of the periosteum is concerned with new bone formation. This is in direct contact with compact bone. The outer layer is relatively a cellular dense connective tissue containing blood vessels. Branches of these vessels traverse the deeper layer. Bone nutrition is by simple diffusion from blood vessels in the periosteum.

On th other hand, it must be recalled that cancellous portion of the mandible is composed of lamellae with its trabeculae being relatively thin and not penetrated by blood vessels. In the mandible, there is no haversian system. Therefore, asfar as its nutritional function is concerned, the cancellous or spongy portion can be discarded without impairing nutrition.

Summary

Mandibular resection for cancer can be conservative both in indication and extent for reasons already stated. Admittedly, until the long term results are known and evaluated this technique will remain attractive. Two illustrative cases were presented and discussed.

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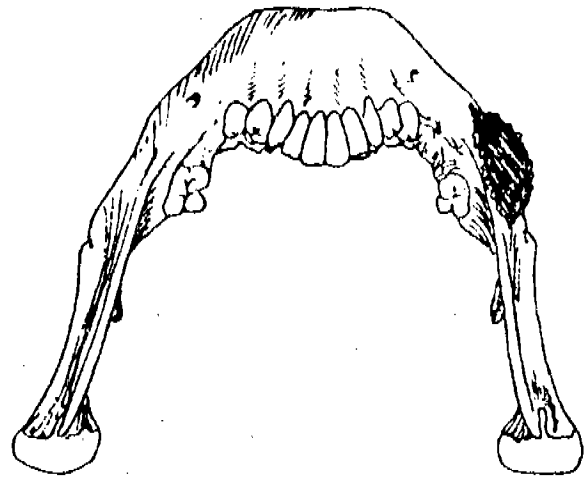

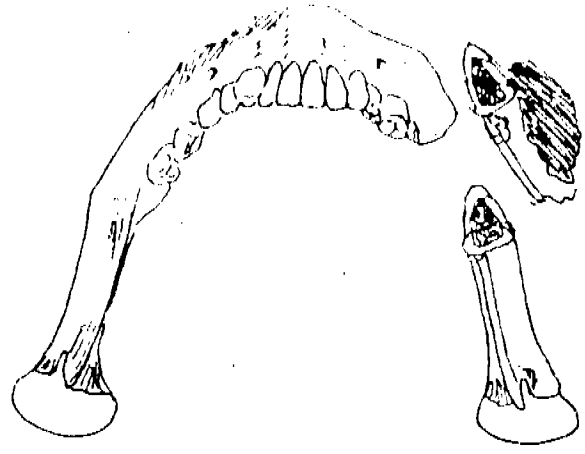

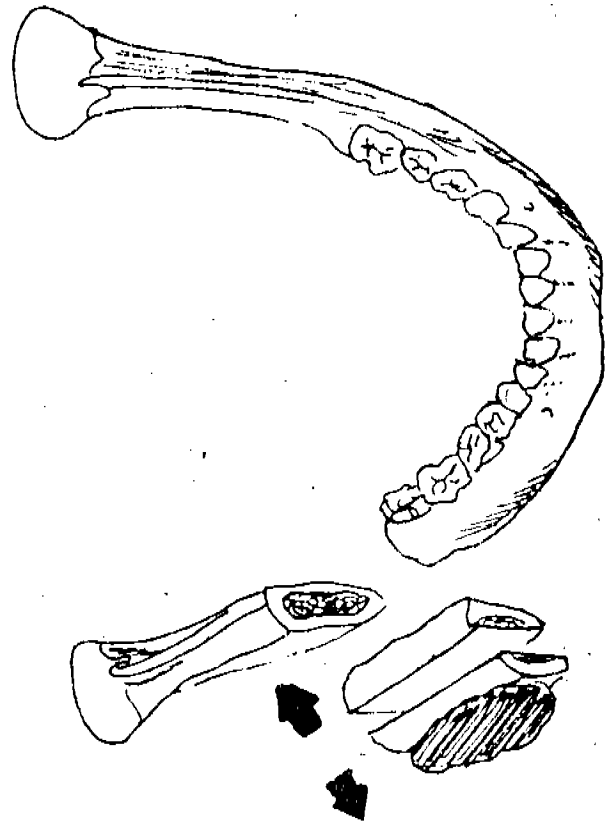

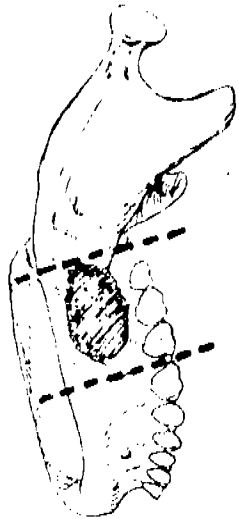

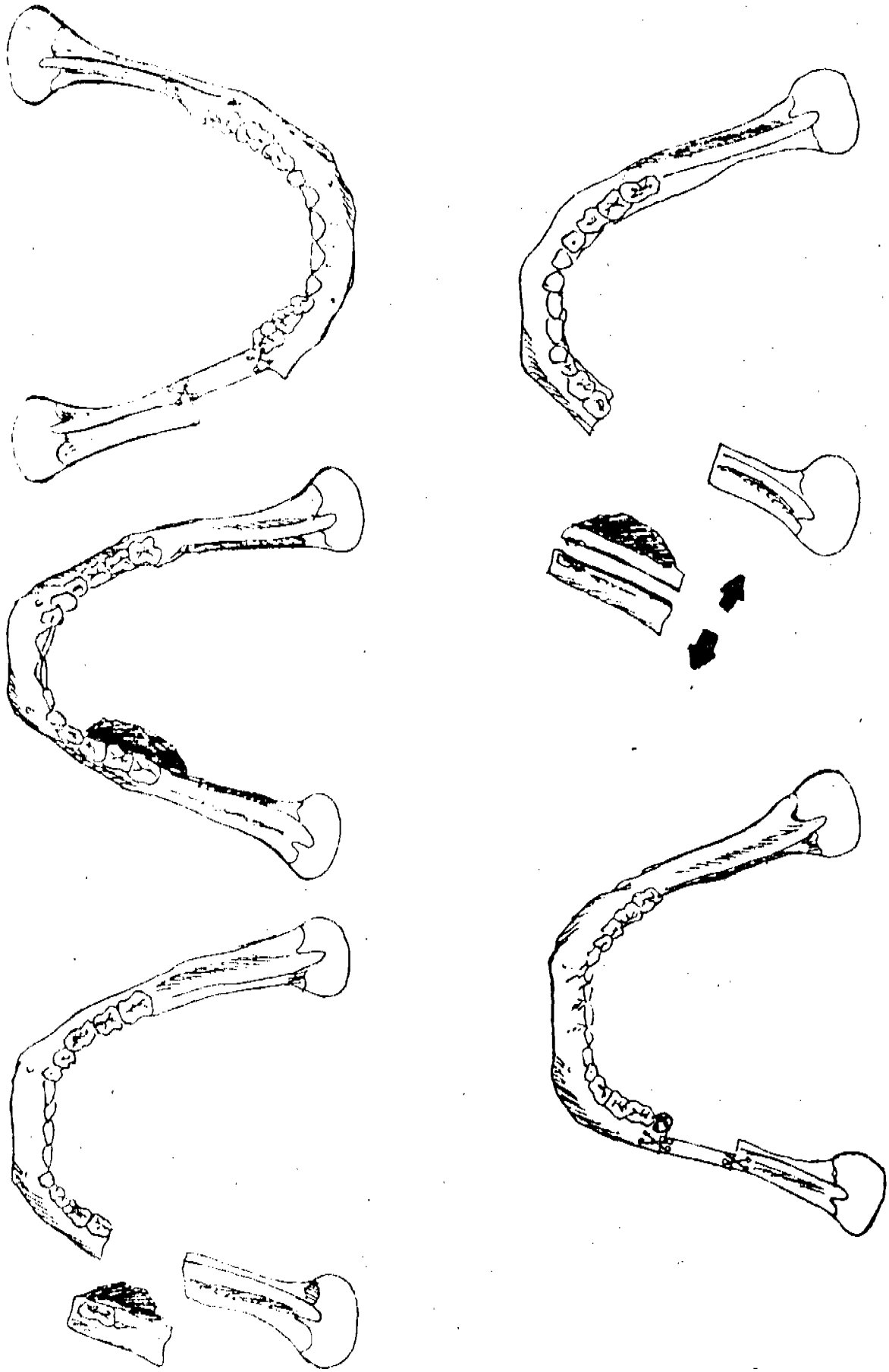

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ANEURYSMAL BONE CYST OF THE MANDIBLE: A CASE REPORT*

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Introduction

In 1952, Jaffe and Lichenstein described what they called aneurysmal bone cyst. Prior to their description this lesion had been identified by many different names. The lesion has been observed in many parts of the skeleton but it occurs especially in shafts of long bones and in the vertebral column. It causes localized distention destruction of the affected bone, limited peripherally by a thin bony shell. The purpose of this paper is to report an unusual occurrence of the aneurysmal bone cyst: the mandible.

Case Report

M.T., a 9-year-old female from Northern Samar was admitted because of a huge left mandibular mass of 4 months duration. The mass was first noted 4 months PTA as a 1 cm. nodule located at the mandibular angle. This mass gradually enlarged so the patient was brought to several "herbolarios" with no relief.

2 months PTA, bloody, pus-like discharge oozed out from the left molar area with accompanying fever.

3 weeks PTA, the patient came to Manila where she was referred to UERM Hospital for further work-up and management.

Pertinent physical examination on admission revealed a poorly nourished, poorly developed girl, with a temperature of 40.5°C, pale conjunctivae, left mandibular mass of 11 x 11 x 8 cm. described to be hard, nontender, smooth with superficial dilated blood vessels, a central scar, presence of halitosis, carious teeth and foul smelling discharge from the lower left first molar. No neck nodes were palpable. There was limitation of lowering the jaw to 2 fingers. Other organ system were unremarkable.

The initial laboratory studies showed anemia of 88 g/l, elevated alkaline phosphatase and ESR of 257 Iu/L and 62 mm/hr. respectively. Chest x-ray revealed normal findings while x-ray of the mandible showed a markedly expanding lytic lesion involving the angle and ramus of the left mandible with marked thinning of the cortex. There was no evidence of periosteal new bone formation noted. Fibrous strands were noted wtihin the lesion with an area of radiolucency at the upper lateral part. Primary impression is new growth of the mandible to rule out the following conditions: ossifying fibroma, adamantinoma, solitary bone cyst.

Before proceeding with surgery this patient was treated with intravenous antibiotics and the hemoglobin elevated with blood transfusions.

At operation on Aug. 27, 1983, the skin was found to be easily peeled off from the mandible up to the angle. The condyle and coronoid processes were obliterated and they were found to be just 2 small protruberances on top to the tumor. Because of the size and extent involving the left mandible a hemimandibulectomy was done. Post-operatively, the course was uneventful. The patient was able to adopt well to her condition. The patient was discharged on the 17th post-op day. And after one follow-up the patient went back to Samar.

Histopathology report revealed on gross examination a specimen consisting of left hemimandibulectomized specimen measuring 11 x 11 x 9 cm. The mandible is irregularly enlarged and grayish. Cut section shows several cystic spaces. The largest of which measures 7 x 5.5 cm.. It contains greenish yellow purulent material. The smaller cyst structures contain yellow mucoid material with hemorrhage. The inner lining of large cyst is reddish, nodular and firm. The bone is eroded and soft. Microscopic examination shows sections of the mandible with locules lined by granulation tissue with mixed inflammatory infiltrates. The surrounding bone is necrotic, interspersed with areas of fibrosis and hemorrhage. There is one area that has cystic spaces whose walls contain multinucleated giant cells. The walls are thinned out and fibrous, the lumen containing red blood cells. The impression given by Dr. Ambrosio Flores, a bone pathologist, is aneurysmal bone cyst with secondary infection of the mandible.

Discussion

Aneurysmal bone cyst, first described as a distinct clinical and pathologic entity by Jaffe and Lichenstein, is a non-neoplastic lesion of bone, consisting of a cystic cavity filled with nonendothelial-lined spaces containing blood. Although these lesions are clinically, radiologically characteristic, their etiology and pathogenesis are frequently debated. Until quite recently a number of papers have appeared giving recognizable description of this lesion, but they were always interpreted as vascular variants of other conditions.

In general, one of two etiological concepts has been offered to explain the development of aneurysmal bone

*Presented August 24, 1984 at the Hyatt Regency Hotel Scientific Meeting on Interesting Cases.

cyst. One is that the cyst is a secondary manifestation developing in a pre-existing lesion altered by hemorrhage, cystic change, or some other superimposed pathological process. The other more widely accepted theory is that the lesion is caused by some variation in the vascular supply or hemodynamics of the region. No remnant of a pre-existing lesion showing evidence of alteration into any aneurysmal bone cyst has been identified in any reported case.

Aneurysmal bone cyst has been found in patients of almost every age over 3 and under fifty, but about three quarters of them occur in the second decade and most of the rest in the third. Though there has been a female preponderance in some series, more adequate figures appear that there is no sex predilection.

The sites of predilection in the series made by B.J.L. Biesecker, M.D. et. al. in May, 1970 on sixty cases in long bones, most commonly the humerus, femus and tibia.

LOCATION OF ANEURYSMAL BONE CYST

Long bones		**Pelvis**	
Humerus	14	Pubis	4
Femur	8	Ilium	3
Tibia	8	Ischium	1
Radius	3	**Verterbral Column**	
Ulna	3	Lumbar	2
Fibula	3	Sacral	2
Small Tubular Bones		**Others**	
Clavicle	3	MANDIBLE	2
Metatarsals	2	Scapula	2
Metacarpals	1	Os Calcis	1
Phalanges	1	Talus	3

Only 2 cases were located in the mandible. Multiple bone involvement was not present in any case.

Aneurysmal bone cysts as seen on roentgenogram develop through several stages. At first the lesion is confined to the cortex and medullary portion of the bone and appears to be eroding these areas. Later, the periosteum is raised, producing the characteristic expansile

Aneurysmal bone cysts as seen on roentgenogram develop through several stages. At first the lesion is confined to the cortex and medullary portion of the bone and appears to be eroding these areas. Later, the periosteum is raised, producing the characteristic expansile bubble-like appearance. Finally, the lesion seem to explode with loss of its shell of subperiosteal bone.

The gross findings are characteristic. The lesion is expanded and surrounded by a very thin layer of subperiosteal bone. Within the mass there is usually bloody, red tissue that is soft and pulpy to the touch, exuding blood easily.

Microspically, there is an exterior thin, limiting cortex of subperiosteal new bone. The lining of the cyst is composed of fibrous tissue and of osteoid in which there may or may not be areas of calcification. There are numerous blood-filled spaces. These usually do not contain muscular coats. The blood in the spaces is not clotted and the erythrocytes are intact. In the septa between the vascular spaces, there are giant cells which are of the foreign body type, being smaller than those seen in giant-cell tumors and containing fewer nuclei. The septa consist of active fibroblasts, collagenous matrix and osteoid.

Differential Diagnosis

1. Fibrous dysplasia -- This is a benign condition that occurs more often in the young, and affects commonly the maxilla. The x-ray features will depend upon the age of the lesion. In the early state, it shows an ill-defined radiolucency but in the latter the x-ray will show a ground glass appearance.

The lesion is also slow growing and does not grow as large as in this case. Histologically, there is replacement of the normal bone by a cellular fibrous tissue. Islands of metaplastic bone trabeculae are seen scattered throughout the fibrous tissue.

2. Ossifying fibroma -- This neoplastic condition is encapsulated and consists of fibrous tissue upon which are scattered metaplastic bone formation. The lesion is also slow growing. Roentgenologically, it is characterized by areas of radiolucencies, punctuated by radioopacities.

3. Ameloblastomas -- This is a slow growing epithelial tumor affecting particularly the mandible. This lesion si basically benign, but it is characterized by local recurrence if the lesion is not adequately removed. The lesion may become malignant and invade the surrounding tissues.

Roentgenologically, the lesion is radiolucent and may become large in size. Most of the lesions are multiloculated, but often times it may be unilocular.

The characteristic histological appearance is the proliferation of the epithelial cells of the enamel organs forming glandular or follicular and plexiform appearance.

4. Fibrosarcoma -- This lesion is often encountered in the jaw. The characteristic x-ray picture is that of a radiolucent lesion with destruction of the involved bone. Grossly the lesion is whitish in appearance and friable in consistency. Microscopically, the characteristic cells are spindle-shaped with anaplstic features.

Treatment

An analysis of 62 cases of aneuyrsmal bone cyst made by Tillman et al in 1968 showed the following results of treatment.

TABLE II

TREATMENT		PATIENT	
Primary	Irradiation also	Treated	With Recurrence
Curettage	No	4	1
	Yes	1	0
Curettage and cautery	No	1	0
	Yes	3	0
Curettage, cautery and graft	No	3	1
	Yes	2	0
Curettage and graft	No	20	7
	Yes	0	0
Resection and graft	No	11	0
	Yes	0	0
Excision	No	0	0
	Yes	1	0
Irradiation alone		1	1
Total		62	13

Because of the various sites of lesions and that some patients were treated as early as 1910 many forms of treatment had been used in these cases. These included excision, resection, amputation and various combinations of curettage, cautery and grafting as in the table.

Recurrences developed in 13 cases.

Treatment most frequently used was curettage of the lesion and bone grafting of the defect. Cautery with curettage did not ensure success. Although thorough removal seemed to give better results than did partial removal.

Radiation was used as an adjunct to surgical therapy in 10 cases and as the only therapy in 1. Recurrence developed in 1 patient with radiation in combination with excision and in the one case in which radiation was used alone.

Total resection one lesion each in the maxilla, mandible and patella was completely successful. It is certainly the treatment of choice for aneurysmal bone cysts in selected sites.

Regarding recurrences age appeared to be a factor: 32% of 28 patients less than 15 years of age when first treated but in less than 12% of the 34 patients older than 15 years; none of the 7 who were more than 25 years old had recurrence.

Summary

Aneurysmal bone cyst is not a new lesion nor is it produced by secondary pathological changes in a primary lesion.

It occurs throughout the skeleton but chiefly in the spine and long bones rarely in the mandible. It tends to occur in the younger age group with no definite preference for either sex. On roentgenogram it has an expansile soap-bubble appearance and extends beyond the normal confines of the bone, being outlined by a thin layer of subperiosteal new bone.

Aneurysmal bone cysts are benign and amenable to treatment by curettage and roentgen therapy. But in selected cases such as the mandible, resection is the treatment of choice.

This paper has reviewed a rare entity, aneurysmal bone cyst, which most often occurs in long bones and spine, less so in the mandible.

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THE 3rd SCIENTIFIC RESEARCH CONTEST (SURGICAL & SURGICAL INSTRUMENTS)

IN

OTOLARYNGOLOGY

Presented on December 6, 1984
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Head & Neck
Surgery

RECONSTRUCTION USING PECTORALIS MAJOR MYOCUTANEOUS FLAP FOLLOWING EXTENSIVE HEAD AND NECK CANCER SURGERY*

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Introduction

In recent times, the emphasis of the head and neck cancer surgeon has shifted to the "quality of life as well as the quantity of life." It should be noted that the seemingly hopeless cases which in the past would have been sent to the radiotherapist rather than being operated on for lack of reconstructive procedures to be carried out are found undergoing surgery. More often than not, the goals of the surgical procedures are to improve the quality of the patient's remaining life. Towards this end, various skin flaps have been developed and used to cover large defects following radical cancer surgery.

At present three different kinds of flaps are used. They are:

1. Axial pattern skin flap, e.g. deltopectoral flap
2. Random pattern skin flap, e.g. rotation flap
3. Myocutaneous flap, e.g. pectoralis major

Axial pattern skin flaps have an anatomically recognized arterio-venous circulation that follows the long axis of the flap and gives off branches to the dermal-subdermal plexus. Its maximum viable length is not related to its width. The Random pattern has no specific vessel and its maximum viable length is related to its width. The myocutaneous flaps have 3 types of vessels which are:

1. Segmental Vessels – large vessels below the muscle masses.
2. Perforator Vessels – vessels that supply the muscle masses.
3. Cutaneous vessels – supplies the skin of which there are three types.
   a. musculocutaneous – from segmental vessels thru the muscle masses to subcutaneous tissue
   b. direct cutaneous – in direct communication with perforator vessels and course superficial to the muscle masses and supply a region of overlying skin.

The rich vascular supply from the muscle masses to overlying skin, a compound skin-muscle masses flap can be elevated without regard to length-to-width ratio as long as the muscle masses has adequate circulation. The inclusion of segmental vessels underlying the muscle masses further ensures proper perfusion thru the perforators to musculocutaneous vessels.

The pectoralis major muscle is a triangularly shaped muscle which originates as three heads:

1) Clavicular – anterior aspect of medial half of clavicle.
2) Sternocostal - anterior surface of sternum and upper six costal cartilages.
3) Abdominal - small, from the aponeurosis of the external oblique muscle.

It functions as a medial rotator of the arm and, together with the latissimus dorsi, it acts as an adductor of the arm. Its main blood supply comes from the thoraco acromial and lateral thoracic arteries.

In contrast studies from 25 fresh cadavers by Semin Baek and Hugh Biller, and in 12 by Freeman, Walker and Wilson, it was shown that the pectoral branch of the thoraco acromial was the most constant blood supply and that the lateral thoracic was inconstant. It was further shown that the cutaneous distribution of the vessels extended from the midline to the anterior axillary line up to the sixth rib.

Materials and Methods

Operative Technique –

Following surgical resection of the tumor, the defect is measured and a corresponding skin over the pectoralis major on its medial side is designed using marking ink. The important landmarks are also delineated-thoraco-acromial vessels just being medial to a line drawn from the acromion to the xiphoid process. A skin incision is then made up to the pectoral fascia from the supero-lateral border of the designed skin to the acromion. The subcutaneous tissues are then undermined medially and laterally around the island up to the lateral border of the pectoralis major. The pectoralis major is then lifted from the underlying pectoralis minor. The thoraco-acromial artery is then identified. A muscle bulk surrounding the artery is divided from the rest of the pectoralis major and is lifted together with the island of skin – which is sutured to the underlying muscles to prevent avulsion of the supplying vessels. The flap is then raised and freed from the underlying tissues up to the clavicle and transposed. A single layer of 3-0 silk sutures is used to attach the island of skin to the defect. The

*1st Prize

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chest wound is closed primarily.

It should be noted that our initial incision was a straight forward line from the supero lateral border of the designed island of skin to the acromion. This had been our standard incision until we encountered a patient with Poland's Syndrome-absence of the pectoralis muscles. Since then, we have modified this incision into what we call the "defensive incision." This is a curvilinear incision just below the acromion to the supero-medial border of the designed island. The upper curvilinear incision is outlined to conform with the lateral border of an imaginary deltopectoral flap. The rationale for this is that, if ever an absence of the pectoralis muscles is encountered, an alternate deltopectoral flap can easily be raised and used to reconstruct the surgical defect without touching the contralateral side. With such, the surgeon will have no doubt in mind that the axial vessels of the delto-pectoral flap has not been violated and, therefore the viability of this flap is assured should it be necessary to use it.

To facilitate the closure of the anterior chest wall defect, we also have modified the design of the island flap. We have started using the crescent shaped design of the island flap. This has not only facilitated closure but also maintained the symmetry of the nipple especially for the female patients.

Case Summaries

Case 1. S.L., 56/M, admitted with a diagnosis of squamous cell Ca, floor of the mouth, right, presented with a 5 x 4 cm ulcerofungating mass and bilateral cervical nodes, 4 x 3 cm on the left. Patient underwent wide excision of the mass including the anterior two-thirds of the tongue, hemimandibulectomy and RND, right and suprahyoid neck dissection on the left. The intraoral defect was closed using PM myocutaneous flap. Patient was discharged 28 days post-operatively.

Case 2. B.T., 50/M, case of dermatofibrosarcoma, left maxilla and buccal area S/P wide excision, developed a gradually growing mass at the site of excision 9 months prior to admission. He had a 8 x 6 cm at the left maxillary and buccal area. Repeat wide excision with partial maxillectomy was done. PM myocutaneous flap was used to cover the intraoral defect and DP flap was used to cover the skin defect. Uneventful post-operative recovery. Patient was sent home 21 days after amputation of DP flap.

Case 3. J.M., 49/F admitted with a diagnosis of squamous cell Ca floor of the mouth, P.E. revealed a 4 x 3 cm ulcerofungating mass at the floor of the mouth extending to the lower gingiva, right with a 2.5 x 2 cm node in the upper jugular chain. She underwent a Commando operation, right and PM myocutaneous flap was used to close intraoral defect. Patient was discharged 2 weeks post-operatively.

Case 4. [illegible], 71/M, admitted with a diagnosis of squamous cell [illegible] gingivobuccal, right. Findings revealed a 6 x 5 cm fu[illegible]ing mass at the right gingivobuccal gutter, with a 1.5 x 1 cm. cervical neck node. He underwent wide excision with the overlying indurated skin, marginal mandibulectomy, and RND, right. Defect at the floor of the mouth and buccal area was closed using the PM myocutaneous flap. Skin defect was closed with an inferiorly based bilobed flap. Uneventful recovery and patient was discharged 12 days post-operatively.

Case 5. P.R., 47/M admitted with a diagnosis of squamous cell Ca, retromolar area. Findings revealed an 8 x 4 mass on left mandible and a 4 x 3 fleshy mass in the posterior third of the tongue. Trismus was present. He underwent Commando, right with wide excision of tongue mass. Reconstruction using pectoralis major myocutaneous flap was done. An infection with oro-cutaneous fistula developed with subsequent necrosis of the flap. A delto-pectoral flap was done after extensive debridement of the necrosis.

Case 6. T.M., 50/M admitted for mandibular mass of one year duration. Examination revealed an 8 x 6 cm. hard fixed mass on the right mandibular area and a 4 x 3 cm. ulcerofungaing mass on gingival area, right. Histopathologic studies revealed squamous cell Ca, moderately differentiated. He underwent classical commando, right oral defect was reconstructed using pectoralis major myocutaneous flap. Post-operative course was uneventful and discharged after two weeks.

Case 7. N.M. 47/M admitted with a diagnosis of laryngeal Ca, right S/P total laryngectomy with RND, right and Amatsu neo-glottis reconstruction with recurrence. Findings revealed a midline hard neck mass 3.5 x 3.5 cm. located above the tracheostoma. There was also a one by one cm. movable firm mass, left neck area. Esophagoscopy showed a fungating mass involving anterior part of upper third esophagus extending circumferentially except one cm. of posterior part of esophageal circumference.

He underwent wide excision of midline neck mass with upper third esophagectomy; total thyroidectomy and RND, left. Esophageal reconstruction using a 6 x 5 cm. tubed pectoralis major island flap anastomosed to upper and lower parts of esophageal remnants. Patient went home after 35 days. Barrium swallow done on OPD basis revealed good peristaltic tone and unobstructed passage of dye.

Case 8. V.B., 43/M admitted with a diagnosis of squamous cell Ca right buccal area. On examination there was a 7 x 7 cm. fungating mass in the right buccal area with extension to the angle of the mouth and two-thirds of lower lip. There was a 1 x 1 cm. upper jugular node. Patient underwent Commando right with wide excision. A combined PM myocutaneous and DP flap was used to cover the wide defect. A second stage tongue flap to reconstruct lower lip was done together with the amputation of the DP flap.

Case 9. P.B., 68/F admitted with a diagnosis of angiosarcoma. On examination there was a 7 x 8 cm. at the right tonsillar area extending to the soft palate to the retromolar trigone. Patient underwent wide

excision of the mass, RND, and partial resection of the hemimandible. The intraoral defect was closed using the PM major myocutaneous flap.

Case 10, J.S. 39/M admitted with a diagnosis of squamous cell Ca at base of the tongue. Examination revealed a 3 x 2 cm mass surrounded by a 4 x 3 cm. induration involving the left base and lateral aspect of the tongue. There were also upper jugular nodes. Subtotal glossectomy with RND, left was done. Reconstruction of the defect was carried out using PM myocutaneous flap.

Case 11. N.Y., 71/M admitted with a diagnosis of gingival carcinoma. Examination showed a 4 x 3 cm. ulcerofungating mass on the right lower alveolar ridge and gingival area. There were multiple nodes at the upper jugular chain. Commando was done on the right and reconstruction done using PM major myocutaneous flap.

Discussion

It has become generally accepted that reconstructive efforts are an integral part of the initial definitive management with curative intent. For the surgeon, armed with the knowledge and skill that major defects can be reconstructed without loss of function and cosmetically acceptable, the limits of resection can be extended to ensure eradication of the disease.

From 1983 November, 1984, pectoralis major was contemplated in 12 cases with St. IV oral-pharyngeal carcinoma. In one case with Poland's syndrome, the DP flap was employed owing to the absence of the pectoralis. In one of the earlier cases, we developed infection of the flap and subsequent necrosis. However, in the majority of the cases (10) where the pectoralis major myocutaneous flap was employed alone or in combination with the deltopectoralis flap, we achieved the necessary reconstruction without any loss of function.

In our experience, we have observed the advantage of this flap which are:

1. It is a one-stage procedure eliminating the necessity for a secondary division of flaps.
2. The donor site is usually closed primarily without the need of skin grafts.
3. The arm pedicle restores the neck contour following RND and serves to protect the carotid artery.
4. It can provide bulk to the defect, e.g. mandibular resection.
5. It can be used to reconstruct even in irradiated areas because it has its own vascular supply and not dependent on the vascularity of the recipient site; it can therefore supply vascularity of the recipient site.
6. The flap can easily cover large skin and mucosal defects since the entire skin over the pectoralis major may be used.
7. Functional deficits are minimized since the latissimus dorsi can very well compensate for the functional loss of the pectoralis major.

The only disadvantages of this flap that maybe encountered is the occasional transfer of hair bearing skin in males and in the female patient, the size of the flap maybe limited.

Summary

We have presented our experiences with the use of the Pectoralis major myocutaneous flap in all patients alone or in combination with the deltopectoral flap. Our own defensive incision modification and the crescent shaped island flap was also described.

The Phil
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BROWNOUT SUCTION MACHINE*

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Introduction

Of the different innovations available to mankind, electricity-no doubts-tops the list of those which made life here on earth bearable and enjoyable. Progress and civilization would not have been what they are today without electricity.

In the Philippines while electrification became a pet project of the Marcos administration, it is ironical that it is electrification that suffered most since the institution of Martial Law especially in the early 1980s with the resultant brownouts prejudicing not only the manufacturing sector but many hospitals as well. The increased cost of oil, destruction of electric power lines, poor maintenance of electric generators and lack of spare parts were blamed for the many unscheduled brownouts.

During one of these brownouts, we happened to have a cardiopulmonary arrest on a 9 months old infant at MCUH. As in any emergency cases, the first step needed to support vital functions is to keep the airway patent and clear. We had suction machines but at that time they became useless because there was no electricity and the only available generator was out of order, so what we used was an asepto syringe, but even in the best of hands, it proved to be difficult and time consuming.

Having witnessed our difficulty, a 4th year medical student instead of being discouraged, was inspired to search for a quicker and economicaly way of aspirating the tracheobronchial secretions.

In 1980, during his clerkship, he began to assemble the machine piece by piece until on his last day, he presented us with this manually operated suction machine. A bit bulky, nevertheless it proved its worth for what it was intended to primarily.

From then on, this machine has been used in similar cases, and has proved indispensable in doing intubations and tracheostomies.

Materials

A. Supporting Frame (Section A)
   1. Metal Plates (iron)
      a. 61 x 35 x 0.5 cm. = 1
      b. 61 x 81 x 0.5 cm. = 1
   2. Angulars (Iron): 0.4 cm. thick
      a. 35 cm. arm width
         1) 35 cm. length = 2
         2) 72 cm. length = 2
         3) 61 cm. length = 2
         4) 64 cm. length = 2
         5) 45 cm. length = 2
      b. 6 cm. Arm width
         1) 60 cm. length = 2
         2) 58 cm. length = 4
      c. 1.5 cm. Arm width
         1) 10 cm. length = 6
         2) 20 cm. length = 3
   3. Multidirectional wheels = 4

B. Bellows and Supports (Section B & C)
   1. Iron Rods = 2 cm. diameter
      a. 36.5 cm. length = 1
      b. 43.5 cm. length = 2
   2. Iron rings. 4 cm. O.D. = 5
   3. Iron S – links = 3
   4. Iron Plates (round): - 0.5 cm. thick; 16 cm. DIA = 2
   5. Metal Ring Clamps (Iron); 16 cm. O.D. x 0.3 cm. thick = 4
   6. Nuts & Bolts ½" x 1" = 4
   7. Bicycle Pedal Axles = 2
   8. Rectangular Iron Rod = 1 x 1 cm.
      a. 6.5 cm. length = 4
      b. 10 cm. length = 2
   9. Iron Plates
      a. 4.6 x 3 c 0.5 cm. = 4
   10. Tire tube interior (Regular Size) 30 cm. length = 2
   11. Wooden Rings: 2 cm. thick = 10 16.5 cm. O.D. and 14.5 cm. I.D.

C. Suction Line Assembly
   1. Rubber tubing: 1.3 O.D.
      a. 14 cm. lengths = 1
      b. 41 cm. lengths = 2
      c. 18 cm. lengths = 2
      d. 54 cm. lengths = 4
      e. 14 cm. lengths = 2
      f. 98 cm. lengths = 2
      g. 41 cm. lengths = 4
      h. 34 cm. lengths = 2
      i. 36 cm. lengths = 1
   2. T-tube Connectors 1.6 cm. O.D. = 9
   3. 1,000 cc Dextrose Bottles = 2 (w/ stopper-rubber)
   4. 5,000 cc Capacity Suction Bottle = 1 (w/ stopper-rubber)

*2nd Prize

**Postgraduate Trainees, MCU-FDTMI

5. Stainless steel tubing 0.5 cm. O.D.
6. Sphygmomanometer Check Valves = 8

D. White Paint

Construction Procedures

A. Supporting Frame (Section A)

Mount on an iron plate 61 x 81 x 0.5 cm., angulars of 0.4 cm. thickness. 61 cm. lengths on the longer sides. These will serve as reinforcement supports for the legs (see Fig. 1). The longer and shorter sides will have a side clearance of 7.5 cm. and 7.0 cm. respectively. All mounts are welded on all four corners. Angular legs of 58 cm. lengths are welded to a 6 cm. x 6 cm. x 0.4 cm. foot plate. At these foot plates, multidirectional wheels are attached (Fig. 2). A 1 x 1 x 45 cm. iron bars are welded on front and back legs for additional support (Fig. 1 & 3).

A 60 cm. angular pillars are welded 38.5 cm. from the front edge and at right angles at the metal table (Section A & Fig. 4). Diagonal angulars support the main pillars 72 cm. from the back edge mounted at the top of both pillars.

A 35 x 61 x 0.5 cm. roof metal plate is mounted with angular bracing on both sides, 35 cm. lengths on top of the main angular pillars (Fig. 4)

B. Bellows & Supports (Section B & C)

On an angular 61 cm. lengths 3.5 cm. cuts are made on its both ends on the same side (Fig. 5). Metal plates are then welded on the cut side with the following dimension 3 x 4.6 x. 0.5. For each four plates. These will serve as bellows axle support. Each plate is mounted 2 of which is 12 cm. from both ends of the cut angular with axle lengths of 9.5 cm. each. The mid distance between both axle supports being 15.5 cm. (Fig. 5). A 1 x 1 cm. hole is cut half curve 2.6 cm. from the edge of the angular.

Bicycle pedal axles are then braced with half circle iron rods 0.5 cm. O.D. with a Y-shaped axle attachment, consisting of an iron bar 1 x 1 cm. of 5 cm. and 10 cm. lengths (Fig. 6). On both iron rods, round metallic plates of 15 cm. diameters are welded with a perimeter iron strip rim (Fig. 7). A 3 cm. diameter stopper hole is made on each half of the bellows' plate.

Corresponding perimeter iron strips are welded on the roof plate with a 3 cm. mid hole for each bellows. All bellows' plates are insured to have air tight welding connections. On the middle of the front roof edge a metal plate with 1 cm. hole is welded perpendicular to the roof plate for bellows support. A S – link is connected to this plate (Section C).

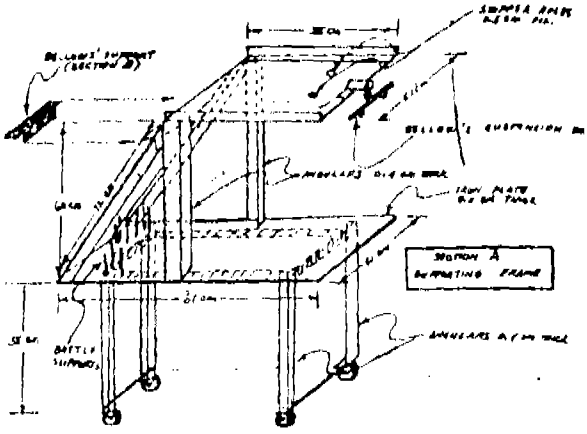
A 30 cm. tire tube interiors of regular size are reinforced with wooden rings 2 cm. thick, 16.5 cm. O.D. and 14.5 cm. I.D. These wooden rings are equally distanced in the tire interiors, 5 for each tube. The tubes are attached to the roof plate and bellows' handle plates, secured tightly by iron rings clamps (Section C).

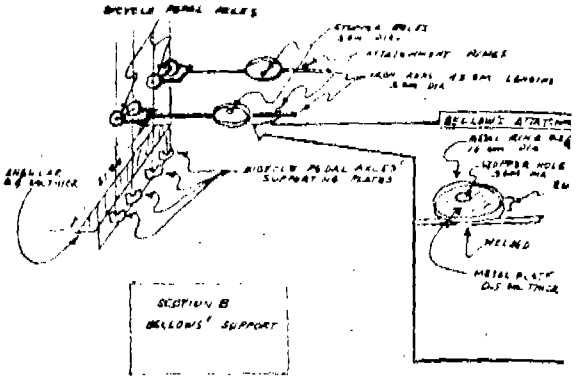
On all four holes, rubber stoppers with 15 cm. lengths stainless tubings 0.5 cm. O.D. are placed, bended at 45° from the roof plate directed backwards. An iron rod 37 cm. lengths with iron rings (Fig. 8) are connected by S – links on the roof plate and that of the bellows' handle (Section C).

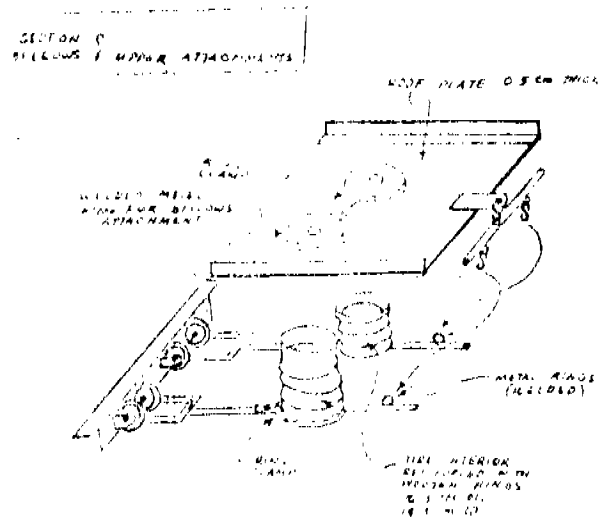
All surfaces made of iron are painted with white paint.

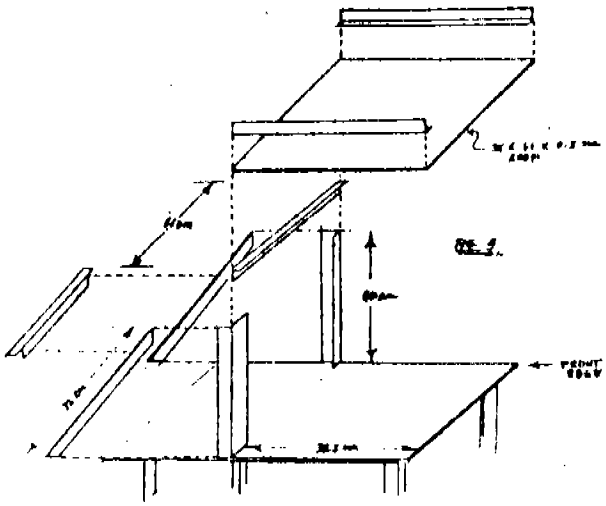
C. Suction Line Connections: (Section D)

A 5,000 cc capacity bottle was used as the main suction bottle with a rubber stopper having 2 stainless tubings 15 cm. lengths of 0.5 cm. O.D. One tube is connected to a rubber tubing for suction, the other to a T-tube connector each dividing to two accessory suction bottles of 1,000 cc capacity each with similar stainless steel tubings. The ends with Sphygmomanometer check valves the outlet o which is directed away from the bottles on the mid circumference. Both circular tubes are attached to both bellows thru the stainless tubes on the roo plate.









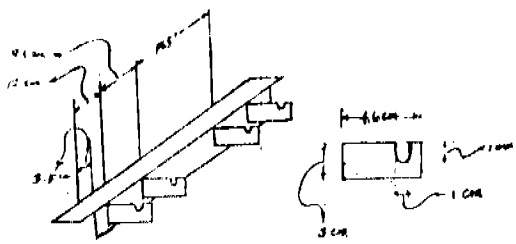
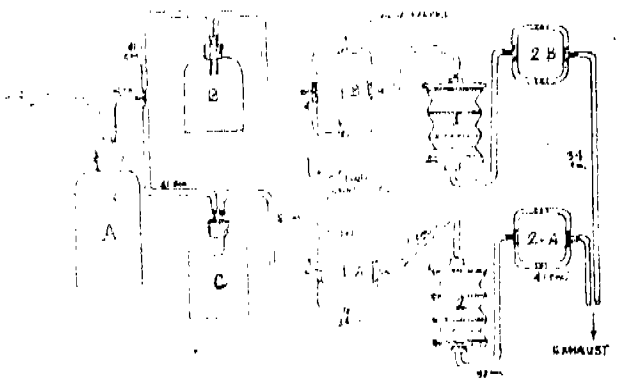


FIG. 5
BICYCLE AXLE SUPPORT



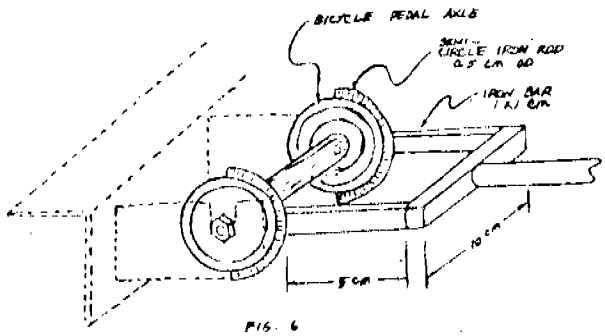
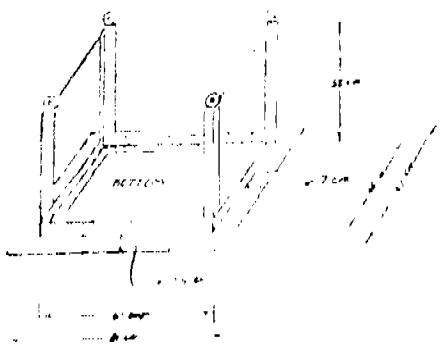


FIG. 6
AXLE BRACE



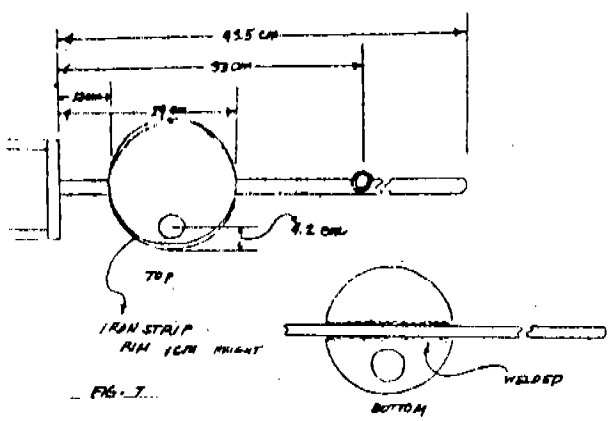


FIG. 7

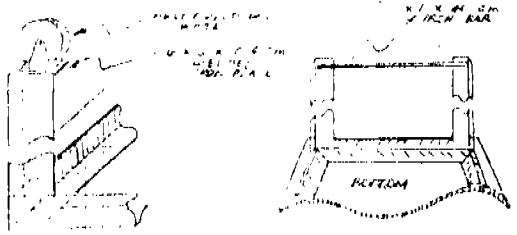


FIGURE 3

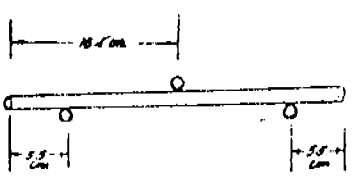


FIG. 8

Mechanism of Operation (see section D)

This brownout suction apparatus works on simultaneous exhaust and suction system of both bellows.

Downstroke of bellows no. 1 will evacuate air in accessory bottle B, with this maneuver bellows no. 2 is compressed expelling air in system 1-A, 2-B & 2-A will ensure the non return of air in suction bottles B & C.

In the same way that bellows no. 2 is expanded with the downstroke of its handle, air bottle C is evacuated. This operation simultaneously compresses bellows no. 1 and expel air in systems 1-B, 2-B and bellows no. 1 itself.

This simultaneous upstroke and downstroke continously create a negative pressure on accessory suction bottles B and C. Equalization of pressure will in turn produce a maintained vacuum in the main suction bottle causing a suction effect

Cost of Construction

Prices of construction materials having gone up, of necessity the ultimate cost of this machine became high but it solved our problem of having a machine which is usable in the absence of electricity and a faltering generator.

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TRACHEAL RESECTION: A SURGICAL OPTION FOR TRACHEAL STENOSIS*

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Adonis Jurado, M.D.**
Romeo Villarta, M.D.**

Introduction

In the advent of modern methods and techniques of anesthesia, surgery has been rendered safer compared to what it was few decades ago. Patients have readily subjected themselves to different types of surgery especially in the absence of pain in general anesthesia. However, complications that are anesthesia-related have increased in number. One of them is tracheal stenosis.

A phenomenal increase in the incidence of tracheal stenosis has been noted since twenty years ago. Aside from the stenosis secondary to prolonged endotracheal intubation which is the most common etiology, other causes implicated are vehicular trauma, improperly performed tracheostomies, and congenital, post-infectious and idiopathic causes.

In the past, we have been very conservative in our management of tracheal stenosis, since we do not want to play and tinker with the airway. We have managed it with dilatation and bougienage, excision of granulation tissue, and injection of steroid. But most of the time, we failed, and we are left with a final option of a permanent tracheostomy, the patient unable to talk and having that unsightly metal tube on his anterior neck.

Two cases of post-intubation stenosis have been presented to us, and this time we were more aggressive. We managed them surgically with primary resection and end-to-end anastomosis, a procedure which we may have heard of, but we never dared to do. With this, tracheostomy tube is gone within 48 to 72 hours post-operatively.

Our objective in doing this procedure is:

1. to determine its effectivity as a method of stricture management.
2. to determine possible post-operative complications of this procedure.

*3rd Prize (Co-winner)

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Pathology

Tracheal stenosis may not be apparent for weeks or even months following the removal of endotracheal tube or tracheostomy decannulation. The development of low-pressure, high volume cuffs has fortunately decreased the incidence of stenosis. However, even with their use, tracheal stenosis still do occur. The most susceptible patients are those with a low cardiac output with subsequent poor oxygenation of tissues. The damage caused by a cuff may vary from superficial mucosal injury with some cicatricial healing to very deep destruction of the tracheal wall, loss of all the cartilages in this area by pressure necrosis and, ultimately, cicatrization of the granulation tissue that proliferates in an effort to heal the injury (Cooper and Grillo, 1969). From this very brief description of the basic pathology of the lesion, it can be seen that the degree of stenosis may vary enormously and that the evolution of the stricture may stop anywhere along the line short of complete occlusion of the trachea, even if untreated.[1]

Surgical Technique (after Ross, 1979)

Preoperative evaluation is done to determine the exact level of the stenosis, the size of the lumen, and the length of the stenosis.

Anesthesia via endotracheal anesthesia tube is best, if feasible. However, intubation through the lumen of the distal trachea may be necessary at various stages of the procedure. Through a low-collar incision extending on both sides of the lateral borders of the sternocleidomastoid muscle, dissection is carried down to the pretracheal fascia. It may be necessary to clamp, divide and transfix the thyroid isthmus. The area of the stenosis is located in relation to the cricoid. The entire trachea is dissected free from 1 cm. above the stenosis to 1 cm. below. If the area is lower, a sternal split maybe necessary. Damage to the recurrent laryngeal nerves is avoided by keeping the dissection close to the trachea at its lateral aspect. The lateral pedicle supply from the inferior thyroid arteries is preserved while mobilizaing the trachea. A naso-esophageal tube aids in the dissection from the esophagus. The trachea is incised horizontally at the interspace nearest the center of the stenosis, cutting to but not through the posterior wall. Serial slices 2 to 3 mm. in thickness are then made above and below the original cut until a normal sized lumen is encountered. At the upper and lower ends the posterior wall is then incised, care being taken not to transect the longitudinal fibers of the esophagus. The stenosis is then removed and hemostasis done.

The following guidelines may be useful in planning the anastomosis.

1. Cervical tracheal mobilization with flexion of the head and neck yields a gain from 4.5 to 5.9 cm. Supralaryngeal release yields an additional 2.5 cm. This is accomplished by dividing the thyrohyoid muscles and superior cornua of the thyroid cartilage (0.5 cm.)

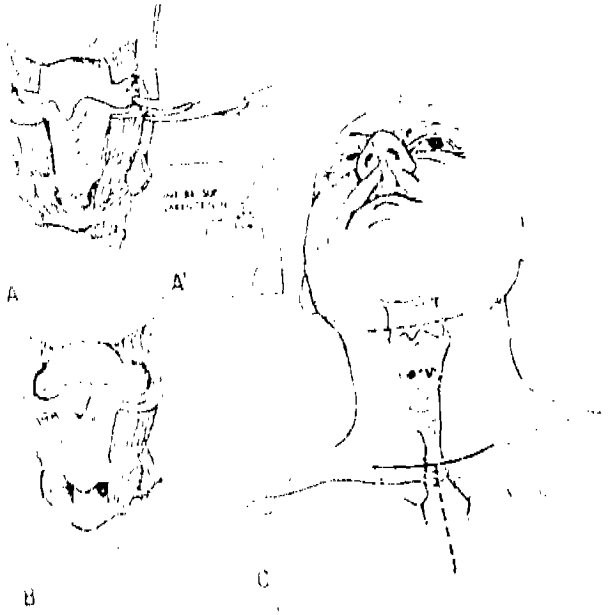
and by dividing the thyrohyoid membrane without entering the lumen of the pharynx (2.0 cm). Avoid damage to the superior laryngeal neurovascular bundle.

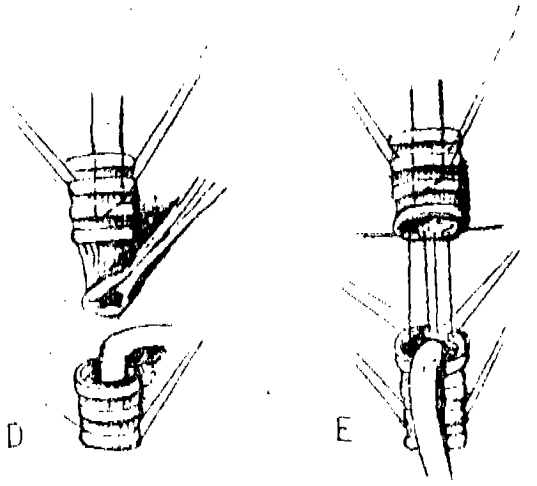
Stenosis less than 4 cm. in length resected by this method offers the best prognosis.

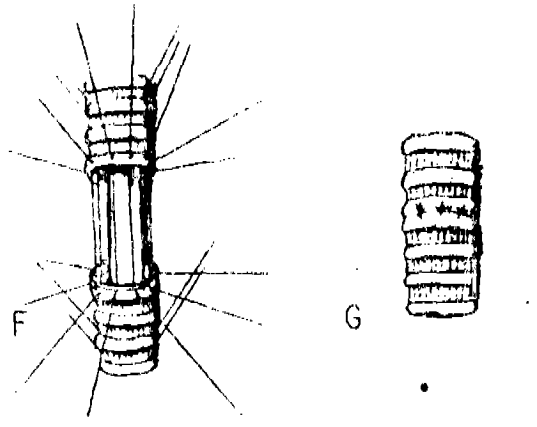
2. Segments between 4 to 7 cm. in length must be treated by cervical tracheal mobilization, flexion of the head and neck, suprahyoid release combined with sternal splitting and mobilization of the main stem bronchus (5 to 6.6 cm.).

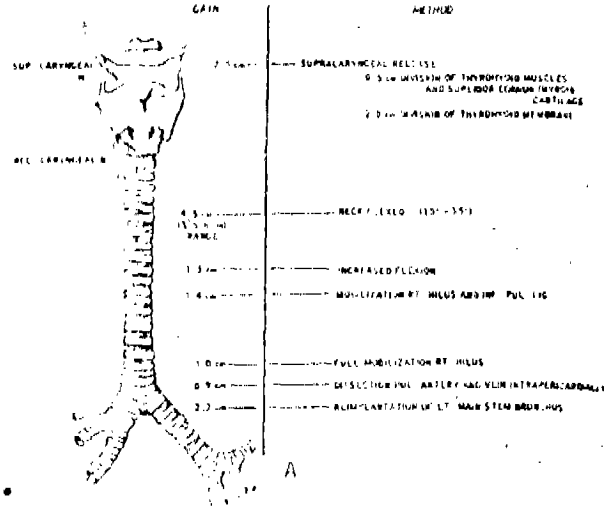
3. It is generally agreed that stenosis greater than 7 cm. in length can not be resected safely.

Anastomosis is accomplished using 3-0 braided synthetic sutures placed 2.5 to 3 mm. intervals, through the posterior wall then the lateral and anterior walls. Sutures should pass through the full thickness of the mucosa and submucosa and cartilage. Knots are tied on the outside. It is utmost to minimize tension on the suture line. Drains are placed under the flap. The incision is closed in the usual manner. If the mediastinum has been opened, a drain is placed there and the sternum is closed in the usual manner.









Postoperative care includes extubation on the second or third postoperative day, head and neck flexed during the healing period, and tube feeding for the first 10 days.

Case Reports

Case 1. A F., 23 year old female underwent ventriculoperitoneal shant operation for hydrocephalus. Postoperatively she developed pneumonia which necessitated prolonged (2 weeks) endotracheal intubation with assisted ventilation. She was subsequently discharged improved. Two weeks later, she noted progressive dyspnea. She consulted at the Department of Otorhinolaryngology, Philippine General Hospital, where an emergency tracheostomy was done. She underwent direct laryngoscopy which revealed concentric narrowing of the tracheal lumen (2 mm) noted 3 cm. below glottis. Retrograde laryngoscopy showed stenosis just above the tracheostoma. The stenosis was about 2 cm. in length. She underwent tracheal stenosis resection with anastomosis. Around 3 cm. of trachea was excised. The postoperative course was uneventful. She was extubated after 48 hours. She was discharged improved after 14 days.

Patient followed-up one month and two months postoperation, asymptomatic with good voice and with no dyspnea. She is now 8 months postoperation, however, she was lost to follow-up apparently asymptomatic.

Case 2. R.G., 17-year-old male underwent craniotomy for intracranial hematoma sustained in a motorcycle accident. Postoperatively, he had ventilatory assistance via endotracheal intubation for 5 days and then via tracheostomy for 14 days. Three weeks post-decannulation, he developed progressive dyspnea necessitating a repeat tracheostomy. He was referred to our institution. A direct laryngoscopy done showed stenosis involving the second and third tracheal rings. He subsequently underwent tracheal resection with end-to-end anastomosis. He was extubated after 48 hours and discharged after 10 days.

Six weeks post-operation, he noted recurrence of dyspnea which made him seek readmission. Direct laryngoscopy showed the presence of granulation tissue at the site of anastomosis. The granulation tissue was excised, cauterized and infiltrated with steroids. The postoperative course was uneventful. The patient is presently 3 months postoperation and is presently asymptomatic.

Discussion

Tracheal stenosis is a condition which is both distressing to the patient as well as the otolaryngologist. Patients who develop tracheal stenosis are usually patients who have been subjected to prolonged endotracheal intubation. Grillo estimates that as approximately 200 out of 250 consecutive cases of tracheal stenosis. After the intubation, the patients note that they develop inspiratory and expiratory stridor after extubation. He, almost always, end up having a permanent tracheostomy.

At the Department of Otorhinolaryngology, UP-PGH, we have been very conservative as regards to management of tracheal stenosis. Dilatation and bougienage was usually done, and unfortunately, we were not successful most of the time. Johnson, et al stated that dilatation rarely lead to satisfactory results in fully developed strictures. As a method of treatment, it is only effective in those cases in which damage of the tracheal wall and loss of cartilage has not occured or when the segment of the cartilagenous damage is very short, according to Bryce, et al. Many patients do find it frightening, onerous and wearisome, since most of the time, if not all, they have to go back to the operating room several times. There is, likewise, a considerable danger of perforation. Most of the time, dilatation simply delays definitive treatment.

In our two cases, there was already loss of the tracheal cartilages as seen intraoperatively, with 3 cm. and 2 cm. of stenosis, respectively; and lumen of 2-3 mm. Dilatation in these two cases would be unsuccessful, and if done would only result in dejected patients with a permanent tracheostomy and a frustrated and unhappy otolaryngologist.

With this mind, we have undertaken this new procedure, a new procedure to many of us, known to some of us, but a procedure never done before in our institution.

The arguments in favor of single-stage resection and anastomosis are:

1. The generally high success rate in all but the most complex cases;
2. The fact that the procedure is a single one with the little attendant risk intra or post operatively in skilled hands; and
3. The short recovery period.

The stenosis in our patients were 2 and 3 cm. in length. This did not present much of a problem surgically since comfortable flexion of the head and neck could easily yield 4.5 cm. Stenosis less than 4 cm. in length resected by this method offers the best prognosis. Beyond this length, the otolaryngologist may request the help of the thoracic surgeon especially in dealing with the transsternal approach. Review of literature shows that it is very rare to see a patient with a long post-intubation stenosis which cannot be anastomosed primarily. Hence, most, if not all could be easily managed with this procedure.

The most common complication that can heppen is the formation of varying amount of granulation tissue at the area of anastomosis. This developed in our patient. This may result secondary to severe inflammation of the airway during the time of repair or by discrepancy in size of the two anastomosed ends. Patients were easily managed with bronchoscopies and removal of granulation tissue and injection of steroid. This has

led to early epithelialization without stenosis. Recurrent stenosis is also possible. Possible causes include excessive tension, discrepant anastomosis and severe infection of the trachea during surgery. Here, another resection anastomosis could be done. Septic complications were uncommon. Injury to the recurrent laryngeal nerve is relatively rare, as well as rupture of the innominate artery in transsternal approach to stenosis. These could be avoided by careful surgery.

In a series done by Grillo in 1977, out of 156 patints, there were 5 deaths (4%). In three patients, reconstruction was done in adverse conditions as a desperate attempt to salvage patients. One with brain damage secondary to trauma, another with supracarinal restonosis after stenting was done in another hospital. Two patients had lung problems, one with bilateral pneumonia and the other underwent peumonectomy, requiring prolonged stay on respiratory ultimately having failure at anastomosis.

In uncomplicated patients, resection anastomosis should not present much of a problem. Within 10 days, the patient could leave the hospital functional and with an anatomically good airway.

Conclusion

The technique of primary resection with end-to-end anastomosis of the trachea appears to be the most definite, simplest, and probably the safest method of managing patients with tracheal stenosis. As in our experience, it can easily be done. The rates of recurrence and complications are acceptable, and their management did not present much of a problem to the otolaryngologist.

We have presented to you two cases of post-intubation stenosis which we managed by end-to-end anastomosis. We are left with two patients well-rehabilitated as far as the airway is concerned, able to talk and able to breath without the unsightly metal tracheostomy tube on their necks.

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IONTOPHORETIC INSTRUMENT*
(a microelectronic application for the Otolaryngologist)

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ABSTRACT

The literature regarding the multiple applications of iontophoresis, as suggested by several investigators, were reviewed. A similar apparatus was designed using locally available parts and materials. The efficacy or usefulness of the manufactured apparatus was tested by using it in the following operations: myringotomy with or without tube insertion, ethmoidectomy and antrostomy. The machine which was found to give adequate anesthesia as required, is reliable and economical.

Introduction

In its purest state, water is non conductor of electricity but aqueous solution containing acids, bases or salts known as electrolytes are good conductors of electricity. Movement of ions under electrical influence is called ion transfer.[1] However, a process by which charged molecules or ions are induced to migrate through tissue under the direct influence of electric current is known as iontophoresis.[2]

Serious consideration in the use of direct current in inducing charged molecules or ions to migrate through tissue is almost as old as electricity. Albrecht (1911) carried out the first experiment to produce analgesia of the tympanic membrane using a high concentration of cocaine (20-40%) and copper electrdoe.[3] Comeau (1972)[3] revived the old technique and claimed that analgesia of the tympanic membrane can be obtained using 2% Lidocaine with 1:2000 Adrenalin and a positive electrode being stainless steel which does not touch the skin but only in contact with the solution. This was confirmed by Echols in 1975.[4]

Several authors also documented ion transfer across tissue (like tympanic membrane and skin) using radioactive tracers and X-ray fluorescence.

Interest for further use of iontophoresis were advanced by several investigators: Crifo et al.[5] (1979) performed transtympanic iontophoresis of N-acetylcysteine. Passali et al.[6] (1983) performed transtympanic iontophoresis of mucolytics and antibiotics in glue ear; Tannenbaum[7] used iodine iontophoresis in tissue scar reduction. Kahn (1980) used hydrocortisone iontophoresis in post surgical temporomandibular trismus and for paresthesia; Greminger[8] (1980) used penicillin and gentamycin iontophoresis in the burned ear chondritis and De Haan et al.[9] (1961) used histamine iontophoresis to increase circulation of tube pedicles and large composite grafts.

Encouraged with the multiple uses of the iontophoretic instrument, we at the Department of Otolaryngology UP-PGH came up with the idea of developing an iontophoretic instrument from locally available parts with due emphasis on economy and reliability.

Materials and Methods

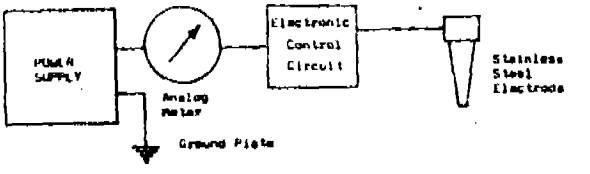
A. Instruments

The design of the instrument requires the following test instruments:

1. Digital Multimeter for testing and precise calibration;
2. Breadboard for prototyping and evaluation of the actual circuit; and
3. Accessory tools like soldering iron, wire strippers, pliers, minidrill and a scientific calculator.

B. Description of Apparatus

The block diagram of the apparatus is shown in Fig. 1.



The principal components are the battery, analog meter, electronic control circuit, stainless steel electrode and ground plate.

1. Battery supplies the necessary electric field for ion transfer from the solution to the tissue; and power to the circuit.
2. Analog meter is for visual monitoring of current output.
3. Electronic control circuit which is the heart of the instrument, monitors and controls the current inspite of variations in battery voltage, environmental temperature and body resistance.
4. Stainless steel electrode and ground plate is used for minimal corrosion and body reaction.

*3rd Prize (Co-winner)

C. Cost

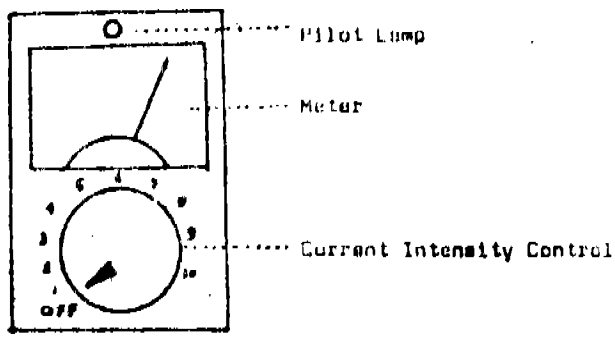
The apparatus made use of the following local components with their prevailing prices. (Table 1)

Unit	Quantity	Price
Battery (9 volts)	1	₱ 10.00
Integrated Circuit	1	₱ 100.00
Potentiometer (5 kilo-ohms)	1	₱ 18.00
Analog meter	1	₱ 98.00
Plastic Box	1	₱ 32.00
Miscellaneous (wires/lead)		₱ 40.00
Total Cost		₱298.00

D. Instrument

The front panel of the instrument shown in Fig. 2 will be composed of:

1. Power Switch and current intensity control which controls the current in the circuit
2. Pilot Lamp monitors the presence of power.



E. Clinical Trials

The proof of any new product is in its efficacy, in performing the function for which it was designed. With this view in mind, a clinical trial using the machine was done with the following objectives:

1. That the instrument will work as designed;
2. That it is safe and simple to use
3. That it is reliable.

The study sample consisted of twenty volunteer subjects. This was further subdivided into two groups: Those wherein tympanic membrane pain thresholds were measured (15 patients) and those wherein ethmoidectomy and antrostomy were done (5 patients).

Fifteen subjects (5 normals and 10 with middle ear effusion) were investigated for tympanic membrane pain threshold. Pre and post iontophoretic pain thresholds were measured in milliamperes using the technique of Johannesen[10] wherein a constant current source was used to provide 0.2ms, 500 Hz DC impulse stimuli. In those patients with middle ear effusion who underwent myringotomy with or without tube insertion, the suggested technique of Echols were done as suggested below.

1. Clean the external canal for better visualization and solution contact.
2. Fill the external ear canal with fresh anesthetic solution using 4% Lidocaine and 1:1000 epinephrine in 1:1 ratio.
3. Insert the positive electrode into the anesthetic in the ear without touching the skin.
4. Place the ground negative electrode on the patients upper forearm using saline soaked gauze in between the electrode and the skin.
5. Apply direct current for five to ten minutes at one milliampere. That includes sixty seconds to raise and lower the current.
6. Suction out excess solution and perform myringotomy with or without tube insertion.

Five patients underwent Ethmoidectomy and Antrostomy for which an open trial using iontophoresis of 4% Lidocaine and 1% Ephedrine Sulfate in 1:1 ratio as another mode of inducing rapid local anesthesia. We modified the positive electrode to make it longer and be able to hold a cotton pledget, so we can insert it into the area of the sphenopalatine ganglion and inferior turbinates. The conventional method of anesthesia was used on the other nasal cavity as arbitrary standard for subjective comparison by the patient against iontophoresis induced anesthesia.

Results

Table 2. Subjects who underwent myringotomy with iontophoresis induced anesthesia.

		Dx	Tube Insertion	Pre Iontophoresis Pain Threshold (milliamperes)	Post Iontophoresis Pain Threshold (milliamperes)
1. S.P.	24/F	OME AD	–	0.65	1.8
2. N.D.	26/M	OME AU	–	0.34	1.2
3. R.H.	15/M	OME AD	–	0.42	1.6
4. A.I.	2/M	OME AS	+	0.74	1.44
5. E.E.	8/F	OME AD	–	0.68	2.31
6. A.U.	26/M	NPCA (OME) AD	+	0.52	1.7
7. B.G.	43/M	NPCA (OME) AS	–	0.53	1.69
8. N.L.	46/M	NPCA (OME) AD	+	0.65	2.02
9. A.E.	35/F	OME AD	+	0.48	1.75
10. I.V.	29/M	OME AS	–	0.42	2.14

Table 3. Normal Subjects, whose pain threshold are compared to physiologic saline against iontophoresis

		Saline Pain Threshold (milliampers)	With Iontophoresis Pain Threshold (milliamperes)
1. M.N.	37/M	0.78	1.49
2. T.V.	22/F	0.35	1.9
3. W.R.	29/F	0.62	2.4
4. Z.A.	40/M	0.47	2.0
5. L.C.	18/M	0.45	1.5

Table 4. Subjects who underwent Ethmoidectomy and Antrostomy (One side with iontophoresis induced anesthesia, other side with conventional anesthesia)

		Operation	Conventional Anesthesia	Subjective Pain on Iontophoresis compared to conventional anesthesia
1. CD	28/M	EA bil.	(L) Topical	(R) lesser by 70%
2. JC	24/M	EA bil.	(R) Topical	(L) lesser by 40%
3. PS	37/F	A bil	(L) Topical	(R) lesser by 30%
4. WL	28/F	EA bil.	(R) Topical	(L) lesser by 60%
5. YS	35/M	A bil.	(R) Topical	(L) lesser by 50%

Discussion and Conclusion

By comparing the pre-iontophoresis pain threshold to that of post-Iontophoresis, we have observed an objective elevation of pain threshold in our subjects with an elevation average of 1.22 milliamperes in those who underwent myringotomy and an average of 1.32 milliampere elevation in normal subjects whose tympanic membrane were tested. In our group of patients who underwent ethmoidectomy and antrostomy, there was a subjective elevation of pain threshold in Iontophoresis induced anesthesia. These prove that our instrument functioned as designed.

Our instrument was used by several persons other than the authors themselves. We observed that they found it easy and simple to use and that there were no complications noted. Thus, it is safe and simple to use.

Visual monitoring of the current output using the meter showed no fluctuation of the current output during the procedure, thus it is reliable.

Our instrument offers the advantages of topical anesthesia application e.g. a faster reaction and less systemic toxicity while eliminating the risk and complications of general anesthesia aside from the considerable expenditures incurred by the patient during the procedure.

It is hoped that this locally made iontophoretic instrument will be highly functional in our day to day practice but also make many therapeutic procedures not only easier to perform but also more acceptable to the patient.

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HEAT CAUTERY: A TREATMENT FOR NASAL POLYPS & RECURRENT ETHMOIDAL POLYPS

Norberto Martinez, M.D.*

Introduction

Nasal polyps are the most common growth found within the nasal cavity. Etiology is variable and can be on the basis of infection, trauma, allergy or thermal change.[1] It is of this reason that the disease entity still poses a therapeutic challenge to many Otorhinolaryngologists. The present modalities of treatment include removal by wire snare or forceps, topical steroid injection,[2] and silver nitrate stick cautery.[3]

Removal by wire snare or forceps may be done under local anesthesia but the procedure is bloody and needs to be done in the operating room. Topical steroid injection is indicated only for small polyps and should be done in repeated doses. Silver nitrate stick application is sometimes difficult and effective for smaller polyps. In search, therefore, of a less bloody and more practical modality of treatment for nasal polyps, we ventured in the application of heat cautery for removing nasal polyps and recurrent ethmoidal polyps.

Objectives

This investigation was undertaken with the general objective of establishing the usefulness of the heat cautery as a mode of treatment for nasal polyps and recurrent ethmoidal polyps.

The specific objectives are the following:

1. To formulate a method of clinical evaluating the effect of heat cautery on nasal polyps
2. To prove that the heat cautery method is a simple and easier modality of treatment for nasal polyps,
3. To provide the Otorhinolaryngologists with a rapid dependable office procedure in the treatment of nasal polyps and recurrent ethmoidal polyps.

*Resident, Dept. of Otolaryngology, UST Faculty of Medicine and Surgery.

Materials and Method

A total of twenty-five patients with nasal polyps seen from January 1983 to October 1984 were included in this study. Included in this prospective study were patients with intranasal polyps and recurrent nasal polyps after surgery.

Excluded from the investigation were pediatric patients, patients with suspected malignancy of the nose, patients with antrochoanal polyps and those who failed to follow-up in the course of the treatment.

The presenting symptoms were noted and heat cautery was applied using a modified instrument innovated from a simple cigarette lighter. The heat application instrument is a modified electronic device that can deliver a regulated amount of heat on its surface. Local surface anesthesia was used on the patients with a one to two centimeter broad tampoon soaked in 4% lignocaine and 0.1% adrenaline.[4] The tampoons were left in situ for about ten minutes. The posterior aspect of the nasopharynx was slightly packed to prevent secretions running down to the nasopharynx during the procedure. The application of heat cautery was repeated until all the polyps have been removed. Follow-up was done on a weekly basis and the polyps as well as the associated symptoms were evaluated until their disappearance. Polyps with associated infection were given one brand of bacampicillin preparation. No other medicatons were given to control the variables involved.

Complete removal of the polyps was the criterion of good response to the modality of treatment.

Results

Of the twenty-five patients included in this study, eighteen were males and seven were females.

The frequency of the presenting symptoms noted are shown in Table 1.

Table 1: Presenting Symptoms

Symptoms	No. of Patients	%
Headache	25	100
Frequent sneezing	21	84
Nasal stuffiness and obstruction	25	100
Post nasal drip	19	76
Halitosis	10	40

Table II lists the common signs noted on examination.

Table II Presenting Signs on Examination

Sign	No. of Patients	%
Edematous polyp	20	80
Fibrous polyp	3	12
Vascular polyp	2	8
Congested turbinate	25	100
Nasal Discharge		
watery	5	20
purulent	20	80

Unilateral polyps were noted in 18 of the cases while bilateral polyps were seen in 7 cases. The size of the polyps were divided into partially obstructing occuring in 24 patients and fully obstructing the nasal cavity as seen in 1 case.

Although the polyps in all cases were removed, the associated symptoms that persisted included headache (8 patients) frequent sneezing (18 patients), post nasal drip (15 patients), and halitosis (3 patients).

On examination after the polyps were removed, the signs that persisted included congested turbinates (14 patients), water nasal discharge (5 patients), and purulent nasal discharge (6 patients).

Table III shows the result of the study as to the number of application of heat cautery.

Table III Polyp size and number of application

Polyp size	No. of Patients	No. of applications	%
Partially obstructing	24		96
	7	2	28
	6	3	24
	8	4	32
	2	5	8
	1	7	4
Totally obstructing	1		4
	1	11	4

The associated radiologic findings noted were maxillary sinusitis in 9 patients, maxillary with ethmoidal sinusitis in 14 patients and polysinusitis in 2 patients.

The complication of pain or feeling of heat sensation during the procedure was noted in 4 patients.

Discussion

The familiar nasal polyp is not a true neoplasm rather they represent focal accumulations of edema fluid accompanied by some hyperplasia of the submucosal connective tissue and a variable inflammatory infiltrate consisting of eosinophils, plasma cells and lympocytes. As such they are inflammatory in nature. Long continued attacks of chronic rhinitis or sinus disease predispose to the tissue changes observed in this condition. Deficient drainage and ventilation from repeated infection produce the pathologic process.

In our series, the symptomatology of nasal polyposis revealed features worthy of note. Headache with nasal stuffiness and obstruction were the most common presenting manifestation.

Heat cautery proved to be an effective modality in removing nasal polyps. This was shown by the results obtained in the study. Mivechie and Hofer[5] states that direct heat death is rapid and essentially complete within 24 to 48 hours after lethal heat exposure. A study by Emani et al[6] revealed that the application of hyperthermia greater than 43°C for 40 minutes resulted in the virtual elimination of capillary blood flow consistent with pathological findings of widespread vessel rupture and hemorrhage in this temperature range.

There are however, certain limitations of this procedure. It cannot be done for antrochoanal polyps. It requires multiple applications for very large polyps. It does not relieve all the signs and symptoms associated with nasal polyposis. The persistence of headache after the treatment could be attributed to other causes such as maxillary and ethmoidal sinusitis, ocular pathology and vacuum headache. Frequent sneezing especially those collaborated with watery nasal discharge point to an allergic pathological nature of the disease thus may persist despite complete removal of the nasal polyp. Post nasal drip and halitosis still manifested after the therapy as accounted to other etiologic factors. The purulent nasal discharge persisted due to the existence of sinusitis thus requiring further surgery.

Conclusion

This study documents that heat cautery is an effective modality of treatment in removing nasal polyp with the following advantages:

1. it is not a bloody procedure;
2. it is an easy procedure and can be done in the clinic.

This investigation also revealed that the effect of heat cautery on the associated signs and symptoms cannot be definitely predicted.

The use of heat cautery can be an added armamentarium by the clinician in dealing with nasal polyps especially recurrent and residual ones. Except for a minor complaint of pain or feeling of heat sensation; this procedure was found to be less invasive and does not require added expenditures due to hospitalization. How-

even, it is deemed necessary for the close cooperation and regular follow-up of the patient to make the procedure an effective one

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PRESERVATION OF THE SPINAL ACCESSORY NERVE IN RADICAL NECK DISSECTION: EVALUATION OF A NEW TECHNIQUE

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Introduction

"Shoulder Syndrome" has been an incapacitating problem in our patients who underwent Radical Neck Dissection because the spinal accessory nerve has been routinely sacrificed. The syndrome as described by Nahum comprises of the following:

1) pain in the shoulder joint
2) limitation of abduction at shoulder joint
3) anatomical deformities characterized by drooping of the affected shoulder joint and prominence of the scapula and shoulder joint muscles.
4) a frozen shoulder that may result as a consequence of the syndrome because of muscular inactivity and imbalance, palsy and pain.

Our experience tells us that when "Shoulder Syndrome" developed in our patients, rehabilitation becomes very difficult. The patient affected is handicapped in both his or her work and daily activities. It is this incapacitating "Shoulder Syndrome" that led us to pursue this study.

The purpose of this paper is to present and evaluate a technique of preserving the spinal accessory nerve function without compromising the radicality of the neck dissection.

Materials and Methods

1. This is a prospective study of 9 patients admitted in the Department of ENT-UP-PGH from March to October, 1984 for various malignancies of the head and neck who underwent wide excision with radical neck dissection.
2. Technique of operation. A technique for preservation of the spinal accessory nerve function in radical neck dissection as described by Weitz, et. al. was followed. A classical neck dissection is done in its usual manner with a modification within the confines of the posterior triangle of the neck. The spinal accessory nerve at the point of exit from the sternocleidomastoid muscle at the level where the motor root fibers of C2-3-4 nerves joins it is preserved. The main trunk that courses through the sternocleidomastoid muscle is cut and goes with the specimen. The rest of the neck dissection proceed in the usual manner.
3. Patients were required to have regular follow-up post-operatively.
4. The patients were evaluated based on the following criteria:
   A. Presence or absence of should pain.
   B. Presence or absence of anatomical deformities as drooping of the shoulder joint.
   C. Presence or absence of limitation of abduction at the shoulder joint.

Based on the above criteria one should have graded our results as Excellent, Good, Fair and Poor. However, we have to discard this because all our paitents showed an excellent results.

Results

Table I:

AGE (yrs)	SEX M	:	F
11 – 20	1	:	0
21 – 30	0		0
31 – 40	0	:	0
41 – 50	0	:	1
51 – 60	2		2
61 – 70	0	:	1
71 – 80	1	:	1
	4		5=9

Table II:

Site & Type of Primary lessions	Stage of the disease	No. of Patients
A. Oral Cavity		
1. Tongue (Epidermoid)		
a. Anterior	Stage IV	1
b. Posterior	Stage II	1
2. Gingiva (Epidermoid Ca.)	Stage IV	1
3. Palate (Ca ex Pleomorphic Adenoma)		1
B. Nasal Cavity (Epidermoid Ca.)		1
C. Thyroid Gland		
1. Papillary Ca		1
2. Type, Unknown		1
D. Larynx, Glottic	Stage IV	1

(Epidermoid Ca.)

8.	Submandibular Gland (Type, Unknown)	1

Table III

Patient	Type of Operation	Lymph node metastasis of Posterior Triangle	Recurrence	Shoulder Status
1.	Wide excision Mandibulotomy RND, (L)	None	(–)	Excellent
2.	Wide excision Marginal Mandibulectomy (L) RND, (L)	None	(–)	Excellent
3.	Wide Excision RND, (R)	None	(–)	Excellent
4.	Total Thyroidectomy, RND, (R) Node Picking, (L)	None	(–)	Excellent
5.	Total Thyroidectomy, RND, (R) Node Picking, (L)	None	(–)	Excellent
6.	Wide Excision Mandibulotomy RND, (L)	None	(–)	Excellent
7.	Total Laryngectomy, RND (L) node picking (R)	None	(–)	Excellent
8.	Wide Excision RND, (R)	None	(–)	Excellent
9.	Wide Excision RND, (R)	None	(–)	Excellent

Table I shows a total of 9 patients who underwent RND. Majority of our patients belong to ages, ranging from 50 to 60 years old. Our youngest patient was 19 years old. There was no significant sex predilection in our series.

Table II shows that most of our patients have Carcinoma of the oral cavity followed by Thyroid, Nasal Cavity, Larynx and submandibular gland. As with other series, Epidermoid Carcinoma predominates in our study, and are usually seen late in the disease.

Table III shows that majority of our patients underwent wide excision of the primary lesion with Radical Neck Dissection. In all our patients the Spinal Accesory Nerve at the level where the motor root fiber of C_{2-3-4} joins it were preserved. No lymph node involvement of the posterior Neck triangle were disclosed intraoperatively and histologically.

All patients were followed-up monthly post-operatively. No recurrence or residual tumor were noted among our patients, nor "shoulder syndrome" noted in our series.

Discussion

"Shoulder Syndrome" is an incapacitating sequelae of Radical Neck Dissection. Many attempts have been done to restore shoulder function. Harris, attempted primary grafting of the severed proximal and distal stumps of the SAN (Spinal Accessory Nerve) by interpolating the great auricular nerve as free graft.

Dewar reported on the Fascial sling fixation of the second and third dorsal vertebral spines to the root of the scapular spine and transplantation of the levator scapulae to the outer end of the scapular spine.

Saunders and Johnson have described physical therapy rehabilitation program consisting of the series of exercises. All of these methods are designed to improve the functionally compromised shoulder.

An alternative to all these techniques is the preservation of the spinal accessory nerve function thereby averting development of "shoulder syndrome."

The technique of preserving the Spinal Acessory Nerve Function in Radical Neck Dissection makes use of the little known anatomical fact that the Trapezius muscle has a dual innervation. It is a well known fact that the main trunk of the Spinal Acessory Nerve coursing through the sternocleidomastoid muscle goes distally to terminate and supplies the trapezius muscle. What is not popularly known is that the trapezius muscle has a second innervation. This comes from the motor root of C_{2-3-4} which join the Spinal Accessory Nerve trunk. This portion is located on the prevertebral fascia plane and also at the posterior triangle of he neck which make it relatively safe from any cancer bearing lymphatics.

Rouviere describes the Spinal Accessory Nerve lymphatic chain as consisting of 5-10 lymph nodes which are intimately associated with Spinal Accessory Nerve after it reaches the sternocleidomastoid muscle and as it crosses the posterior triangle of the neck to pierce the trapezius muscle. He mentioned of the uppermost portion (Superior) which are closely associated with the highest node of the jugular chain and the lower most nodes (inferior) which lie deep to the trapezius muscle. It is this inferior nodal group that some authors preserved since they are adjacent to the Spinal Accessory Nerve after it exits from the sternocleidomastoid muscle and before it enters the trapezius muscle. It lies within the posterior triangle of the neck.

Skolnik and his colleagues as well as Mc Gavran Bauer and Ogura reported that the posterior triangle of the neck has not been found to be the site of metastasis in their respective series. This prompted these author to suggest preservation of the entire posterior triangle of the neck, including the Spinal Accessory Nerve in Radical Neck Dissection.

Schuller found out in his series that the Spinal Accessory metastic nodes most commonly occur along the superior portion and not within the confine of the

posterior triangle.' This superior Spinal Accessory Nodal chain are intimately related with sternocleidomastoid muscle and upper jugular chain of nodes. This portion of the Spinal Accessory Nerve is proximal to that portion where the motor fiber of the C_{2-3-4} nerve join it and therefore has to go with the specimen.

Our stand is uncompromising. We still take out all the structures of the posterior triangle of the neck as in the classical neck dissection with the exception of the portion of the Spinal Accessory Nerve where the motor of C_{2-3-4} joins it, unless a gross involvement is noted. The proximal part of the Spinal Accessory Nerve has to go with the specimen to maintain the radicality of the procedure.

Summary

Nine patients admitted in the Dept. of E.N.T.-UP-PGH Medical Center underwent Radical Neck Dissection for various primary malignancies of the head and neck. The technique follows the usual manner as in the classical neck dissection with the modification based on the preservation of the portion of the Spinal Accessory Nerve at the level where the motor root of C_{2-3-4} nerves join it. In all our cases, no residual or recurrent tumor was noted nor "Shoulder Syndrome" was observed.

Why should "Shoulder Syndrome" be allowed to occur if we could avoid it?

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