Editorial Board

Editor-in-chief
Professor Rajendra Guragain

Editor
Professor Dharma Kanta Baskota

Managing Editor
Dr. Prakash Adhikari
Dr. Rabindra Pradhananga
Dr. Yogesh Neupane

Editorial Advisory Board
Professor Jishnu Prasad Rijal
Professor Ram Chhaya Man Amatya
Professor Rakesh Prasad Shrivastava
Professor Bimal Kumar Sinha
Professor Hari Bhattarai

International Advisory Board
Mr. Neil Weir - UK
Professor P.S.N. Murthy - India
Professor Alamgir Choudhary - Bangladesh
Professor Tariq Rafi - Pakistan
Dr. Dinesh Chhetri - USA

This Journal is the official publication of the Society of Otolaryngologists of Nepal (SOL Nepal) Maharajgunj, Kathmandu, Nepal
Tel : 977-1-4720575, Fax : 977-1-4414191
E-mail : nepalese.jenthns@gmail.com
Nepalese Journal of ENT Head & Neck Surgery (Nepalese J ENT Head Neck Surg) has an online manuscript submission system. Visit our website (www.solnepal.org.np) for details about manuscript submission, editorial policy, subscription of the Journal and advertisement in the Journal.

For any informations on the Journal please contact

Professor Rajendra Guragain
E-mail: professorrajendraguragain@hotmail.com

Dr. Rabindra Pradhananga
E-mail: rabindrabp@yahoo.com

Dr. Yogesh Neupane
E-mail: yogeshneupane79@gmail.com
### Subscription

The subscription for the Nepalese Journal of ENT Head & Neck Surgery will be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Annual</th>
<th>Per Copy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nepal (Nepalese Rupees)</td>
<td>450.00</td>
<td>225.00</td>
</tr>
<tr>
<td></td>
<td>750.00</td>
<td>375.00</td>
</tr>
<tr>
<td>SAARC Countries (Eq. of Indian Rupees)</td>
<td>600.00</td>
<td>300.00</td>
</tr>
<tr>
<td></td>
<td>1200.00</td>
<td>600.00</td>
</tr>
<tr>
<td>Other Countries (Eq. USD)</td>
<td>60.00</td>
<td>30.00</td>
</tr>
<tr>
<td></td>
<td>120.00</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Please contact Dr. Rabindra Pradhananga / Dr. Yogesh Neupane at nepalese.jenthns@gmail.com for subscription.

---

This Journal and the individual contributions contained in it are protected under copyright by Society of Otorhinolaryngologist of Nepal (SOL Nepal). No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of publisher.

---

No responsibility is assumed by the publisher for any injury and /or damage to person or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instruction or ideas, contained in the material herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnosis and drug dosages should be made.

---

### Executive committee of SOL Nepal (2009-2011)

- **President**
  - Prof. Rajendra Guragain
- **Vice President**
  - Prof. Toran KC
- **General Secretary**
  - Prof. Dharma Kanta Bastola
- **Joint Secretary**
  - Deependra Shrestha
- **Treasurer**
  - Narmaya Thapa
- **Joint Treasurer**
  - Meera Bista
- **Members**
  - Dhundiraj Poudel
  - Kiran Rai
  - Rabindra Bhakta Pradhananga
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EDITORIAL</strong></td>
<td>7th SAARC ENT Conference</td>
<td>1</td>
</tr>
<tr>
<td><strong>ORIGINAL ARTICLE</strong></td>
<td>Evaluation of Mucociliary Function of Eustachian Tube in Children with Chronic Otitis Media Mucosal Type</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Study on Functioning of Efferent Auditory Pathway in Mentally Challenged</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Reliability of Sino-nasal Outcome Test in Measuring the Outcome of Septoplasty</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Identification of Allergens by Skin Prick Test in Patients of Pokhara Suffering from Allergic Rhinitis</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Analysis of Taste Disturbances in Patients Before &amp; After Mastoid Surgery</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Study of Nerve Injury in Parotid Gland Surgery</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Outcome of Endoscopic DCR at TUTH</td>
<td>20</td>
</tr>
<tr>
<td><strong>CASE REPORT</strong></td>
<td>Benign and Malignant Lipogenic Tumors of the Retropharyngeal Space</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Osteoma Temporal Bone - Rare Case</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Spindle Cell Rhabdomyosarcoma of the Tongue - A Rare Entity</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Leiomyosarcoma of the Nasal Cavity</td>
<td>29</td>
</tr>
<tr>
<td><strong>MEDICAL EDUCATION</strong></td>
<td>Outcomes of Paediatric ENT Appointment for Surgery</td>
<td>31</td>
</tr>
<tr>
<td><strong>REVIEW ARTICLE</strong></td>
<td>Recurrent Respiratory Papillomatosis</td>
<td>33</td>
</tr>
<tr>
<td><strong>HOW I DO IT ?</strong></td>
<td>Palisade Cartilage Myringoplasty</td>
<td>36</td>
</tr>
<tr>
<td><strong>BOOK REVIEW</strong></td>
<td>How To Write Thesis - A Complete Guideline</td>
<td>38</td>
</tr>
<tr>
<td><strong>INSTRUCTION FOR AUTHORS</strong></td>
<td></td>
<td>39</td>
</tr>
</tbody>
</table>
The society of Otolaryngologists of Nepal (SOL Nepal) successfully hosted the 7th SAARC ENT Congress in Tribhuvan Army Officer’s Club, Kathmandu from 25th-27th May 2011. It was inaugurated by the Right Honorable President of Republic of Nepal, Dr. Ram Baran Yadav.

This was a gala gathering of more than 400 delegates not only from the SAARC countries but also from other Asian countries, Europe, America, Australia and rest of the world.

Live demonstration of temporal bone dissection by Dr Ravi Ramalingam and moderated by Dr GVS Rao was very informative. Prof Mohan Kameswaran on Dr LN Prasad Oration very clearly highlighted the current status and the future of auditory neural prosthesis.

Dr MV Kirtane and his expert team presented interestingly on different aspects of ENT updates. The topics discussed were endoscopic repair of CSF rhinorrhoea, cochlear implants, brachytherapy in ENT, sialendoscopy, pitfalls in stapes surgery, endoscopic pituitary, phonosurgery – current concepts, endoscopic approach to skull base lesions, juvenile nasopharyngeal angiofibroma, bone anchored hearing aids, occult primary, bilateral vocal cord palsy management, approach in the management of snoring and obstructive sleep apnoea syndrome.

Prof Tarafdar from Bangladesh, Prof Agarwal from India and Prof Tariq Rafi from Pakistan delivered key note addresses on laser in phonosurgery, Bangladesh perspective, future prevention of deafness in SAARC countries and current concepts in the management of head and neck cancers. Panel discussion on the clinical relevance of modern vestibulometry and current controversies in the management of vertigo by Prof Anirban Biswas from India was also very interesting.

There were panels on oral cavity cancer, sleep disorders, FESS, vertigo, laryngeal cancer, cochlear implant, hearing aid and rhinoplasty. Likewise, updates on head and neck, otology, paediatric ENT, rhinology, speech and audiology.

There were informative sessions on ear camps and laser. Prof Gulati conducted jolly ENT quiz. The poster presentation and free paper sessions dealt with many aspects of the specialty.

Overall, the conference was regarded as a success and the credit goes to the organizing committee, experts, all the participants and the sponsors.

I hope the forthcoming 8th SAARC Congress which is going to be in Pakistan will be equally successful.
EVALUATION OF MUCOCILIARY FUNCTION OF EUSTACHIAN TUBE IN CHILDREN WITH CHRONIC OTITIS MEDIA MUCOSAL TYPE

Objective:
To assess eustachian tube mucociliary function in children with chronic otitis media mucosal type.

Material and methods:
It is a prospective comparative analytical study carried out in Ganesh Man Singh Memorial Academy of ENT and Head Neck Studies, TUTH, Kathmandu. Patients of COM mucosal with 3 to 12 years of age and both gender were taken. Revision cases, conditions with obvious eustachian tube dysfunction and caretaker of children not giving consent for eustachian tube evaluation were excluded. Dye used was 0.25% Gentian Violet and flexible nasopharyngoscopy was done to see if eustachian tube opening was stained with dye. Eustachian tube was labelled as patent if staining was there otherwise labelled as obstructed.

Results:
Thirty-eight patients were included in study, out of which 19 (50%) had patent tube. Out of 8 cases in ≤7 years age group, 6 (75%) had obstructed eustachian tube. In ≥8 years age group, 13(43.33%) had obstructed eustachian tube.

Conclusion:
Mucociliary function of eustachian tube evaluation by dye method in COM mucosal type in children shows equal proportion of patency and obstruction.

Keywords: eustachian tube, dye test, mucociliary function

INTRODUCTION:
Chronic otitis media –mucosal, inactive has been defined by Browning in 1997 as a clinical condition where there is permanent defect of pars tensa with no current evidence of inflammation either of the middle ear mucosa or tympanic membrane. Prevalence of chronic otitis media mucosal type in Nepal and neighbouring countries has been found to be high. It is 7.6%2 to 13.2%3 in Nepal which is comparable to results of study done in neighbouring countries like Bangladesh and India.4 5

According to WHO/CIBA workshop of otitis media experts in 1996 COM is a public health problem in Nepal. Many authors have proposed eustachian tube as a factor playing important role in pathogenesis of COM-mucosal and hence in outcome of myringoplasty. Eustachian tube is developmentally an outgrowth of the pharynx. This dynamic conduit between nasopharynx and middle ear normally reaches its adult size by age of seven years.7,8 The eustachian tube being short and horizontal in children may be causing easier access of bacteria from nasopharynx leading to higher incidence of COM in children.9 There is higher incidence of COM in children with Cleft palate and Down’s syndrome10 which are known to have eustachian tube dysfunction as well.

Though eustachian tube has always been a centre of interest in COM, there is no universal and comprehensive methodology to evaluate it preoperatively and postoperatively. Various methods have been described in different times. Some methods test anatomical aspects like patency while others evaluate functional aspect. In earlier days testing was done by non physiological methods like Valsalva and Toynbee. Ventilation function assessment by pressure equalization using impedance audiometry has been widely used. For last two decades it is thought that only mucociliary clearance function assessment has prognostic significance in myringoplasty.11,12 Evaluation of mucociliary function is more frequently done nowadays. e.g.: dye clearance, saccharine test, contrast radiography, radioisotope scanning.13-18 Foreign material introduced into the normal middle ear is promptly evacuated through the eustachian tube into the nasopharynx.19,20 Tubal mucociliary transports is important for elimination of the inflammation products from the middle ear enabling recovery of the affected mucosa of the middle ear, local circulation and restoration of normal air pressure in the middle ear.21 Adequate clearance of middle ear helps healing of the mucosal epithelium; poor drainage yields poor results.22,23 Assessment of eustachian tube in children is more relevant as the obstruction of the tube is more common in this age group. Though eustachian tube function is taken as important aspect it is neglected due to difficulty in evaluation. Assessment by instilling of otic drops and asking the child to taste was also used. Though it seems quick and simple; but the child must be old enough to reliably report the taste of an eardrop.24 Reliably assessing eustachian tube function requires a method that doesn’t depend on child’s ability to perform a task.25 So far there has been no study where mucociliary function is exclusively tested in children. The objective of this study is to assess eustachian tube patency preoperatively in children undergoing myringoplasty under general anaesthesia.

MATERIALS AND METHODS:
It is a prospective comparative analytical study done in Ganesh Man Singh Memorial Academy (GMSMA) of ENT and Head and Neck Studies, Kathmandu, Nepal. Study was started after obtaining ethical clearance from Institutional Review Board. The study was conducted for a period of nineteen months starting from 15th Nov 2007 to 15th June 2009. Children below or equal to 12 years of both genders having COM mucosal inactive disease were taken. Exclusion criteria were condition with obvious eustachian tube dysfunction e.g.-cleft palate, nasopharyngeal mass, chronic or acute rhinosinusitis and patient or caretaker not willing to undergo eustachian tube test.

Child and caretaker were explained about the procedure to be done. After counselling, verbal consent was taken. Nasal pack made by soaking cotton in 4 % lignocaine and 0.025% oxymetazoline hydrochloride nasal solution was inserted into ipsilateral nasal cavity. Child was then asked to lie in bed of treatment room in supine position. Half millilitres of 0.25% sterile Gentian Violet (GV) was drawn in a 3 or 5ml disposable syringe. Intravenous cannula 18 G was applied over the syringe. Under microscope the tip of cannula was inserted into middle ear cavity via the perforation and the dye (Gentian Violet) was instilled. Time of instillation was recorded. Then child was made to lie in lateral position with testing ear uppermost for 16 minutes.

After 16 minutes child was made to sit and nasal pack was removed with nasal forceps. Staining of pack with GV was noted. If there was no staining then using tongue depressor oropharynx of child was examined for dye staining. If still no staining noted then flexible
nasopharyngoscopy was done in ipsilateral side for GV staining at or near eustachian tube opening. If still there was no staining it was labelled as obstructed.

RESULTS:
There were altogether 43 patients who fulfilled the enrolment criteria. But 5 cases had upper respiratory tract infection and were excluded; hence 38 cases were included in the study. Out of 38 cases there were 20 females and 18 males. The age of patients ranged from 4 years to 12 years. Most common age in this study was 12 years (26.3%). Out of 10 patients of 12 years age 6 were females and 4 were males. Out of total ear that underwent eustachian tube test, 21 were of right side and 17 were of left side. There were equal number of patients with obstructed eustachian tube and patent tube i.e. 19 in each. Out of 19 patent cases, fourteen cases had dye seen only after nasopharyngoscopy, five had pharynx stained with GV and none had stain in nasal pack. There were 8 cases with age 7 years and below and 30 were more than 7 years as shown in Fig-1. Out of 8 cases in ≤ 7years age group, 6 (75%) had obstructed eustachian tube. In ≥ 8 years age group only 13 (43.33%) had obstructed eustachian tube.

From table 1, we can correlate age groups and eustachian tube patency which after application of Z test for mean, p value was computed to be more than 0.05. Hence though patent tube was found in higher age group this is not statistically significant. Contralateral ear was taken as diseased if there was history of middle ear surgery in other ear, or during evaluation there were signs of COM. As shown in Fig-2 in diseased contralateral ear there was 16/29 (55.1%) obstructed eustachian tube while this value in normal contralateral ear was 3/9 (33.3%).

DISCUSSION:
Several methods have been described to assess tubal function, but most of the methods used are complicated, time consuming and need elaboration. The simpler methods, which are available, are non-physiological and more or less quantitative, indicating anatomical patency of the tube, which does not necessarily mean normal function.26

We used 4% lidocaine in nasal pack so that if nasopharyngoscopy need to be done there won’t be much discomfort to the child. Both lidocaine and preservative methylparaben may not be the cause of dye effect should not be significant as we made the child to lie down in lateral position with testing ear uppermost. Hence any amount of drug reaching the nasopharynx would find its way to opposite eustachian tube end which was not tested. As we are not testing both ears of the child in same setting, this effect should not be of paramount importance. Besides 0.025% oxytetracycline has no effect in human nasal ciliary beating frequency (CBF).27,28

Method of testing eustachian tube used in this study has been taken from Sen et al study (1999)23 and Raychowdhury study (2000) with some modifications. In our study use of tragal pressure if dye was not seen at nasopharyngeal end has not been done because use of such pressure is not physiological and doesn’t occur in natural circumstances. In their study it has been done in both active and inactive COM mucosal but we have taken only inactive cases. This eliminates any obstruction secondary to mucosal edema, granulations or inspissated mucous.

Other dyes used in eustachian tube evaluation are Methylene blue15, Indigo13, 4% Fluorescein sodium,16 Gentian Violet has been used in this study because it has been used in other previous studies.23,29 It is generally considered safe for use on children and breastfeeding mothers and its property of staining the tissue makes easy detection of presence of dye in nasopharynx. It is used as a medication in middle ear as antifungal and also in granulation tissue. The dye used here (0.25%) is less than reported therapeutically(1-2%) hence side effect of the dye is minimal.

Time allowed for dye to reach nasopharynx before labelling “obstructed” in different studies ranges from 10-30 mins13,15,16,23. Allowance of longer time however has possibility of getting more false positive result where rather than mucociliary function, the gravity plays role. This is evident if we compared those studies. Obstruction rate is only 5.12% in Takahashi et al study where 30 minutes have been used as compared to 32% in Sethi et al study where 10 minutes have been used. Before inserting endoscope we looked for dye stain in pharynx and nasal pack so that unnecessary insertion of endoscope in child could be avoided. In our study to our surprise exact number of children had obstructed eustachian tube (50%) and patent tube. This could be due to small sample size. It is in contrast to Sen et al study23 where 9 out of 50 (18%) patients had obstructed tube. Roychowdhury et al study also had similar result i.e. 7/30 (23%). Though methodology was similar with same dye used in all these cases, our study was only done in <12 years children in which eustachian tube dysfunction is expected more than in adults. Obstructed tube was found in 22.1% in Prasad et al’s study and 32% in Sethi et al’s study both of which were performed in adults. Their result is also less than that of ours probably due to same cause.

Evaluation done by test other than dye test however shows high proportion of obstructed eustachian tube. Yuceturk et al22 in 1997 observed eustachian dysfunction in 71.7% of the CSMG group and it was only seen in 34.9% of the control group using pressure equalization test and toynbee test.

In our study in less than or equal to 7 years child, 75% had obstructed eustachian tube which is much higher than that of ≥ 8 years child. But this difference is not statistically significant (p>0.05). This discrepancy can be due to smaller sample size ≤ 7 years group (n=8). Similarly, mean age in patent eustachian group is marginally more than that in obstructed group but the result is not significant.
CONCLUSION:
Mucociliary function of eustachian tube evaluation by dye method in COM mucosal type in children shows equal proportion of patency and obstruction. When compared to other studies with similar methodology this proportion of obstruction is more in children than adult. But to establish its predictive value and develop as a routine preoperative eustachian tube evaluation method, further prospective studies preferably with control should be carried out.

REFERENCES:
STUDY ON FUNCTIONING OF EFFERENT AUDITORY PATHWAY IN MENTALLY CHALLENGED.

Objective: The main objective of the study is to compare the amount of suppression of TEOAE’s with contralateral stimulation in mentally challenged children and age matched normal children and further to study the functioning of the efferent auditory pathway in children with delayed maturation of the auditory pathway especially in individuals with non-Down’s syndrome.

Material and methods: The present study was aimed at investigating the contralateral suppression of Transient Evoked Otoacoustic Emissions (TEOAEs) in normal children as compared with that of developmentally delayed. 15 mentally challenged children in the age range of 7-12 years and gender matched normal children participated in the study.

Results: Results suggest reduced contralateral suppression of TEOAEs in mentally challenged children as compared to their normal counterparts. Contralateral suppression was observed at more in left ear compared to right ear. The mid frequencies were observed to have greater suppression in both ears.

Conclusion: The results of the current study reinforce the contention that contralateral suppression of TEOAEs is reduced in children with delayed maturation and provides insight for confirming the risk of auditory processing difficulties and speech perception in noise. The association between contralateral acoustic stimulation and OAE allows easy, non-invasive study of auditory efferent mechanisms and seems to be clinically feasible for evaluating cochlear status and auditory efferent function.

Keywords: efferent auditory pathway, mentally challenged, otoacoustic emissions

INTRODUCTION: Hearing is one of the most important sensory functions of the body which enables individuals to have an effective communication. It has been demonstrated that the ear, besides receiving sounds, also generates sounds. These sounds emitted by the ear are called as Oto-Acoustic Emissions (OAEs). These emissions were first described by Kemp in 1978.1 Human auditory system has both afferent and efferent pathways. The efferent auditory system is a descending bundle, which originates from the auditory cortex and terminates at the sensory cells of the organ of Corti. In 1946, Rasmussen reported the discovery of the Olivo-Cochlear (OC) system.2 It was reported that the outer hair cell (OHC) innervations is primarily from the Medial Olivo-Cochlear efferent System (MOCS). Since OAEs are thought to reflect these dynamic properties, it has been hypothesized that activating the medial efferent system would produce alterations to cochlear micromechanics and hence, to OAEs. The first description of the active mechanical behavior of outer hair cells was made over 20 years ago.3 In the literature, it is reported that afferent auditory fibers from the cochlear nerve project mainly to the contralateral MSO nuclei.4 It is well established that the amplitude of both types of Evoked Otoacoustic Emissions (TEOAEs as well as the DPOAEs) can be suppressed when simultaneous contralateral sound stimulation is applied 5,6 and is due to mediation of medial efferent system.

Effect of age and maturation of the medial efferent system on the amplitude of TEOAE was studied and reported that amplitude increased with the age and maturation.7,8 Since, fibers of MOCS predominantly innervate OHC’s, it is presumed that they exert their suppressive influence via this pathway and most probably by interfering with cochlear amplifier function.9 Hence, from the literature, it is observed that functioning of MOCS is best studied in individuals with Down’s syndrome or in individual with Mental Retardation10 or delayed maturation.

In the literature, TEOAE studies done on Down’s syndrome and mentally retarded individuals showed reduced emissions.11-17 Hood et al study observed reduced TEOAEs in individuals with auditory neuropathy and commented that the poor efferent responses observed could be due to compromised afferent input to the OCR pathway.18 They also commented that, efferent suppression of otoacoustic emissions could be used as a differential measure of auditory function in patients with auditory neuropathy/dys-synchrony. The current study was aimed to explore TEOAE suppression with contralateral stimulation in mentally challenged children compared with age and gender matched group of normal children.

MATERIAL AND METHODS: Fifteen children with normal hearing sensitivity and mentally challenged comprised of experimental group. Their age ranged from 7-12 years and their IQ from 35-50 as certified by a qualified Clinical Psychologist. Children with middle ear disorders were excluded from the study. Children with normal hearing and with the presence of TEOAE in both ears were included in the study. Age and gender matched normal children formed the control group who were evaluated to rule out any hearing loss and or middle ear disorders.

A calibrated dual channel diagnostic audiometer, immittance audiometer and Biologic Scout report program (V 3.02) systems were used. Prior to the instrumental evaluation, a visual examination of the ear canal of both ears was done using an otoscope to rule out any outer ear abnormalities. Pure tone thresholds were obtained at octave frequencies using Modified Hughson – Westlake procedure in a sound treated room. Tymanometry and reflexometry were carried out with a probe tone of 226 Hz. A good probe fit was ensured while testing for OAEs and data that had 50% above reproducibility, 90% stability, +3 dB S/N ratio, artifact rejection threshold of 50mPa were considered.

After clear instructions and verbal consent from the participant, an appropriate probe fit was obtained by observing the stimulus spectrum. Initially, TEOAEs were recorded by eliciting them with 80sec linear clicks at 60-65 dBSPL. For contralateral stimulation, white noise was delivered through headphones from an audiometer. The continuous noise at 5dB above click stimulus was presented in the contralateral ear simultaneously. An average of 200 responses repeated twice was considered for each recording. Average TEOAE waveforms were obtained to measure the reproducibility, with reproducibility greater than 50% being considered. Data for frequencies 1000Hz, 1500Hz, 2000Hz, 3000Hz and 4000Hz were recorded. Suppression of TEOAEs was explored by subtracting the ‘with noise’ average from ‘without noise average’. Data was subjected to statistical analysis using Students t- test and Mann-Whitney-U test to compare the TEOAE suppression results of normal hearing children with that of mentally challenged children.
RESULTS:
To study the functioning of the efferent auditory pathway in individuals with mentally challenged, 15 participants with mentally challenged and age matched normals were studied using Transient Otoacoustic Emissions and its suppression. The Mean, Standard Deviation, p values and z values of contralateral suppression measures in right ear between normal & mentally challenged children for frequencies 500 Hz, 1 kHz, 1.5 kHz, 2 kHz, 3 kHz and 4 kHz are given in Table 1 and Fig. 1.

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>MC</td>
<td>N</td>
<td>MC</td>
<td>N</td>
<td>MC</td>
</tr>
<tr>
<td>Mean</td>
<td>0.81</td>
<td>7.27</td>
<td>0.66</td>
<td>3.34</td>
<td>1.46</td>
</tr>
<tr>
<td>SD</td>
<td>1.46</td>
<td>1.65</td>
<td>1.37</td>
<td>1.81</td>
<td>1.64</td>
</tr>
<tr>
<td>z(= 1.96)</td>
<td>2.82</td>
<td>-1.7</td>
<td>-1.5</td>
<td>-1.20</td>
<td>2.62</td>
</tr>
<tr>
<td>p(&lt; 0.05)</td>
<td>0.005</td>
<td>0.85</td>
<td>0.13</td>
<td>0.227</td>
<td>0.009</td>
</tr>
</tbody>
</table>

Fig. 1. Mean values of TEOAE suppression between mentally challenged and normal children in right ear.

From Table 1, it is observed that, in right ear at 1 kHz the mean contralateral suppression is of statistically significant difference (p < 0.05) between the two groups (normal hearing individuals and mentally challenged), confirming the presence of greater suppression in normal children than in mentally challenged children. At 1.5 and 2kHz, greater suppression in normal individuals is observed as compared to mentally challenged children; however, it is not statistically significant. At 3 kHz and 4 kHz, it is interesting to note that greater suppression is seen in mentally challenged children as compared to the normal group; however, the difference is not statistically significant. On scrutiny of the results from Table 2, it is can be observed that, in left ear at 1, 2 and 3 kHz, normals had greater suppression compared to mentally challenged individuals and the difference being statistically significant. However, at 1.5, and 4 kHz, although normals had greater suppression, the difference was not statistically significant. From the data, it is interpreted that, majority of the frequencies show greater suppression in normal than in mentally challenged children.

DISCUSSION:
The current study was done to compare the amount of suppression of TEOAE’s with contralateral stimulation in normal children and mentally challenged children of the age matched group to study the functioning of the efferent auditory pathway. From the results it is observed that, the contralateral suppression was more in majority of the frequencies in normal children and reduced in mentally challenged children, implies that in the mentally challenged children, there is a delay in maturation of the efferent Medial Olivo-Cochlear Bundle (MOCB).

Significant suppression effect demonstrated in the present study is in agreement with the reports of Andersson et al.13 From studies, it is evident that normal and mature MCOB and efferent auditory pathway are essential to elicit OAE suppression. 3,4,9,19 The maturation delays observed in Down’s syndrome and mentally challenged do affect the efferent auditory pathway.

Studies on individuals with Down’s syndrome have commented that delayed maturation of efferent auditory pathway could be due to reduction in brain myelination beyond early childhood in developmentally delayed children. 11-17,20 Further, Down’s syndrome children have different degrees of developmental disabilities, developmental delays and developmental brain abnormalities with CNS maturation delay and cortico-digénese.20 From the results of developmental, neuro imaging studies, it can be inferred that poor efferent responses are related to the compromised afferent input to the olivocochlear bundle pathway in mentally challenged children and support the hypothesis that “poor efferent responses are related to compromised afferent input to the olivocochlear bundle” as quoted in the literature.18 The compromised efferent auditory pathway thus plays a role in TEOAE suppression and leading to reduced TEOAE suppression when contralateral stimulus is given. As observed in the current study, reduced TEOAE suppression in most of the frequencies could be due to maturational abnormalities.

In the literature, studies have concentrated more in the Down’s syndrome category of mentally challenged group and have reported of reduced suppression. The present study, excluded the Down’s syndrome subjects and considered only the mentally challenged to see if similar results are observed as in Down’s group. Results do confirm similar suppression pattern (reduced) in the mentally challenged group exclusive of Down’s syndrome and enable us to state that the contralateral suppression is lesser in all categories of mentally challenged and attributable to lack of maturation of efferent auditory pathway or abnormalities in MOCB pathway as reported in the literature. The results of the current study also endorse the use of efferent suppression of otoacoustic emissions as a differential measure of auditory function in patients with developmental delay.

CONCLUSION:
In conclusion, there exists evidence that the assessment of the medial olivocochlear system, by recording OAEs under contralateral acoustic stimulation helps in the diagnosis of auditory maturation delays, especially efferent auditory pathway, auditory processing disorders and other hearing disorders related to delayed maturation of the efferent auditory pathway. It also acts as a non-invasive tool for hearing screening of infants who are at risk for hearing loss and also at risk for hearing problems due to neural maturation.

REFERENCES:

© Society of Otorhinolaryngologists of Nepal (SOL Nepal)


RELIABILITY OF SINO-NASAL OUTCOME TEST IN MEASURING THE OUTCOME OF SEPTOPLASTY

Objective: To assess the subjective benefits to the patients undergoing septoplasty using Sino-Nasal outcome test (SNOT-10) scoring system.

Materials and Methods: It is a prospective, longitudinal and comparative study done at Department of Otorhinolaryngology and head & neck surgery, Tribhuvan University Teaching Hospital, Kathmandu, Nepal. Ninety patients who underwent septoplasty between November 2007 to March 2009 were kept in study group, and 45 patients without any intervention were the control. Sino-nasal outcome test (SNOT-10), was measured and graded from 0 to 3, depending upon the severity, Z’ test for mean was used as a statistical tool.

Results: Total 135 (90 cases and 45 control) patients with deviated nasal septum were included. The total mean SNOT score improvement was from 7.73 (S.D.-3.2) to 2.23 (S.D.-1.69 i.e. 71.13% one month after surgeries. The mean SNOT score improvement was from 6.57 (S.D.-2.36) to 5.88 (S.D.-2.6) i.e. 10.48% after one month in the control groups. There was a statistically significant improvement (p<0.001) in post operative SNOT-10 score in patients who underwent septoplasty. However, improvement in control group was not found to be statistically significant (p>0.05) using the same score. Comparison of post-operative SNOT scores between cases and controls was statistically significant. Comparison of difference of SNOT score pre and post operatively between cases and controls using ‘Z’ test for mean (p<0.001) was also statistically significant.

Conclusion: SNOT-10 scoring system is a reliable subjective evaluating tool to observe the outcome of septoplasty and there was a significant symptomatic improvement seen after septoplasty in symptomatic DNS patients.

Key words: septoplasty, SNOT, DNS, objective tests

INTRODUCTION: Septoplasty is one of the most common surgeries done by the otorhinolaryngologists. There are various indications for the septoplasty, but most important among them is nasal obstruction. To observe the relief of the different symptoms, various types of objective assessment tools are available. Most important among them are Nasal peak flow meter, Rhinometry, Rhinomanometry and Acoustic Rhinomanometry. The use of these objective tools has always been debated to see the symptomatic improvement. The measurements of these objective tools are not comparable with the subjective feeling of the patients. That is why most of the surgeons have to rely on the subjective symptoms for the indication, as well as outcome measurement of the septoplasty. In lieu of observing the subjective improvement, various subjective assessment tools have been developed. SNOT (Sino-nasal outcome test) is a tool of one of its kind, in which both nasal and health related symptomatic improvements are assessed. This tool was initially used to assess the benefits in the treatment of the rhinosinusitis. Later on, it was also used for measuring the outcome of the functional endoscopic sinus surgery. Buckland1 in 2003 used this scoring system for the first time to assess the improvement after septoplasty. Various modifications have been made eventually, according to the convenience of different authors for their specific needs. Based on the experience and applicability in our setup, 10 symptoms SNOT scoring system (SNOT-10) has been developed, which is more thoughtful and practical in evaluating the outcome of septoplasty in our context. In this modified SNOT-10 scoring system, the health related symptoms have been excluded. To further simplify this scoring system, four grades (zero to three) depending on the severity of the symptoms, were used instead of six grades used by Buckland et al.1 This study is first of its kind in Nepal to evaluate the outcome of septoplasty using a subjective scoring tool. This study will help to generate a valid scoring system for septoplasty outcome as well as for indication of surgery.

MATERIAL AND METHODS: This is a prospective, longitudinal and comparative study of cases undergoing septoplasty, performed in Department of Otorhinolaryngology and Head & Neck Surgery, Tribhuvan University, Teaching Hospital, Kathmandu, Nepal from 15th November 2007 to March 2009. Outcome measure was done using Sino-nasal outcome test (SNOT-10) comprising ten nose related symptoms from grade 0 to 3, depending upon the severity, after measuring its validity and reliability. Regarding validity and reliability of SNOT scoring system,

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Nil (0)</th>
<th>Mild (1)</th>
<th>Moderate (2)</th>
<th>Severe (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal obstruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runny nose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sneezing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facial pain / headache</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cough</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need to blow nose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post nasal discharge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thick nasal discharge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epistaxis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of smell and taste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
who couldn’t follow-up, were contacted on telephone. For statistical significance, controls were also selected. They were evaluated using same SNOT-10 score. These controls were prescribed sodium chloride nasal drops for 10 days. Controls were also followed up after one month and evaluated on the same SNOT-10 score. If they could not follow up, they were contacted on telephone. Statistical analysis was done using SPSS 11.0 software. At first, frequency and percentages were calculated for individual symptoms of SNOT-10 scoring system. Then ‘Z’ test was used to compare the preoperative and postoperative symptoms scores.

RESULTS:
Out of 150 cases done in the study period, 90 cases were selected for the study. Rest of the cases were excluded due to concomitant turbinectomy surgery or rhinosurgery. 10 cases either didn’t follow up or could not be contacted on telephone. Most of the cases were male i.e.77 out of 90, in the study group and 37 out of 45 in control group. (Table-2).

The mean age of the patients was 25.6 years in the study group and ranging from 13 to 52. It was 29.6 years in the control group aged ranging from 15 to 65 years. The most common symptom was nasal obstruction in both the groups. Out of 90 cases, 33 were contacted on telephone for follow up. Most of the surgeries were done under local anaesthesia (73). Most of the cases were left sided DNS i.e. 60 out of 90 but surprisingly it was predominantly right sided DNS in the control group (Table-2). The most common symptom was nasal obstruction in both study group and controls, followed by need to blow nose, facial pain and headache, sneezing, thick nasal discharge, runny nose, loss of smell, cough, epistaxis and post nasal drip, in the study group as mentioned in detail in Table-2.

<table>
<thead>
<tr>
<th>Table 2: Demographic details of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
</tr>
<tr>
<td>Total patients-</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age range</td>
</tr>
<tr>
<td>Mean age</td>
</tr>
<tr>
<td>M/C Symptom</td>
</tr>
<tr>
<td>2nd M/C symptom</td>
</tr>
<tr>
<td>Least common</td>
</tr>
<tr>
<td>F/U on telephone</td>
</tr>
<tr>
<td>Left DNS</td>
</tr>
<tr>
<td>Right DNS</td>
</tr>
<tr>
<td>GA/LA</td>
</tr>
</tbody>
</table>

The maximum improvement in the study group was seen in epistaxis and minimum in sneezing. Total relief in nasal obstruction was seen in 77%, mentioned in detail in Table-3. Sino-nasal outcome test (SNOT-10) scoring (Study group). Table-3 shows the final SNOT-10 score of the study group having overall scores of each individual symptoms,

<table>
<thead>
<tr>
<th>Table 3: Sino-nasal outcome test (SNOT-10) scoring (Study group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom</td>
</tr>
<tr>
<td>Nasal obstruction</td>
</tr>
<tr>
<td>Runny nose</td>
</tr>
<tr>
<td>Sneezing</td>
</tr>
<tr>
<td>Facial pain</td>
</tr>
<tr>
<td>Headache</td>
</tr>
<tr>
<td>Cough</td>
</tr>
<tr>
<td>Need to blow nose</td>
</tr>
<tr>
<td>Post-nasal discharge</td>
</tr>
<tr>
<td>Thick nasal discharge</td>
</tr>
<tr>
<td>Epistaxis</td>
</tr>
<tr>
<td>Loss of smell or taste</td>
</tr>
<tr>
<td>Total score</td>
</tr>
<tr>
<td>2 Runny nose</td>
</tr>
<tr>
<td>3 Sneezing</td>
</tr>
<tr>
<td>4 Facial pain</td>
</tr>
<tr>
<td>Headache</td>
</tr>
<tr>
<td>5 Cough</td>
</tr>
<tr>
<td>6 Need to blow nose</td>
</tr>
<tr>
<td>7 Post-nasal discharge</td>
</tr>
<tr>
<td>8 Thick nasal discharge</td>
</tr>
<tr>
<td>9 Epistaxis</td>
</tr>
<tr>
<td>10 Loss of smell or taste</td>
</tr>
</tbody>
</table>

The mean age of the patients was 25.6 years in the study group and ranging from 13 to 52. It was 29.6 years in the control group aged ranging from 15 to 65 years. The most common symptom was nasal obstruction in both the groups. Out of 90 cases, 33 were contacted on telephone for follow up. Most of the surgeries were done under local anaesthesia (73). Most of the cases were left sided DNS i.e. 60 out of 90 but surprisingly it was predominantly right sided DNS in the control group (Table-2). The most common symptom was nasal obstruction in both study group and controls, followed by need to blow nose, facial pain and headache, sneezing, thick nasal discharge, runny nose, loss of smell, cough, epistaxis and post nasal drip, in the study group as mentioned in detail in Table-2.

Table 4: Sino-nasal outcome test (SNOT-10) scoring (control group)

| Symptom | Pre-op | Mean | Post-op | Mean |
| Nasal obstruction | 77 | 1.17 | 64 | 1.42 |
| Runny nose | 25 | 0.55 | 27 | 0.60 |
| Sneezing | 26 | 0.57 | 27 | 0.60 |
| Facial pain | 35 | 0.77 | 36 | 0.73 |
| Headache | 8 | 0.17 | 7 | 0.15 |
| Need to blow nose | 54 | 1.2 | 50 | 1.11 |
| Post-nasal discharge | 10 | 0.22 | 11 | 0.24 |
| Thick nasal discharge | 24 | 0.53 | 18 | 0.40 |
| Epistaxis | 11 | 0.24 | 4 | 0.05 |
| Loss of smell or taste | 26 | 0.57 | 24 | 0.53 |

The mean age of the patients was 25.6 years in the study group and ranging from 13 to 52. It was 29.6 years in the control group aged ranging from 15 to 65 years. The most common symptom was nasal obstruction in both the groups. Out of 90 cases, 33 were contacted on telephone for follow up. Most of the surgeries were done under local anaesthesia (73). Most of the cases were left sided DNS i.e. 60 out of 90 but surprisingly it was predominantly right sided DNS in the control group (Table-2). The most common symptom was nasal obstruction in both study group and controls, followed by need to blow nose, facial pain and headache, sneezing, thick nasal discharge, runny nose, loss of smell, cough, epistaxis and post nasal drip, in the study group as mentioned in detail in Table-2.

The maximum improvement in the study group was seen in epistaxis and minimum in sneezing. Total relief in nasal obstruction was seen in 77%, mentioned in detail in Table-3. Sino-nasal outcome test (SNOT-10) scoring (Study group). Table-3 shows the final SNOT-10 score of the study group having overall scores of each individual symptoms,
pre and post-operatively, their mean and overall improvement. Table 4 shows symptoms like runny nose, sneezing and PND has deteriorated after the one month of evaluation in the control group. Surprisingly, epistaxis has dramatic improvement of 63.64% as compared to overall improvement of 10.48%. From Fig: 1 and 2 we can know that how many patients have improvement of at least one grade, no change or worsening of an individual symptom of the SNOT-10 score in the study group. Table: 5 shows comparison of pre and post septoplasty SNOT scores in cases (n=90).

| Table 5: Comparison of pre and post septoplasty SNOT scores in cases (n=90) |
|---|---|---|---|---|
| Mean score | S.D. | ‘Z’ value | ‘p’ value | Inference |
| Pre-op | 7.67 | 3.2 | 13.92 | P < 0.001 | Significant |
| Post-op | 2.3 | 81.69 | |

On applying the ‘Z’ test of mean in comparison of pre and post septoplasty total SNOT scores in cases, Z’ value was 13.92. The ‘p’ value was less than 0.001 which is significant statistically (Table 5). It means, post operative improvement after septoplasty was drastic. At the same time, the same comparison after one month of first evaluation in control was not significant statistically because the ‘p’ value calculated to be more than 0.05 (Table 6).

**DISCUSSION:**

Studies on outcome after septoplasty are not new. Many authors have reported on this topic and the results have been consistent as patients have good results after septoplasty. However, many studies were retrospective. Some of those were also chart reviews, retrieving physician rated outcomes. Patient based outcomes were not assessed much in the past. Siegel et al 4 used a validated sinusitis instrument after septoplasty and found improved scores but at the same time, he also used a global Quality of life instrument and found no changes after septoplasty. Although there are several useful validated instruments for use in rhinosinusitis, all are for patients with rhinitis and/or sinusitis. Their content is focused on rhinorhea, facial pressure, cough, etc. but lacks many features of deviated nasal septum. The SNOT score was originally designed for rhinosinusitis. This is a single questionnaire that can quickly be completed in an outpatient setting by the patient and can be used on a regular basis to observe the outcome of the septoplasty surgery. SNOT-10 (Table 1) has been prepared after several modifications in the past and present scoring system. The validity and reliability of SNOT has been done in pilot studies by test-retest and internal validity measures. The overall improvement of SNOT score after septoplasty was 71.13% which is comparable with many of the studies. Mean overall NOSE scale improvement was 65.88% done by Stewart et al. Total NOSE score benefit of 70% after septoplasty was observed by Rhee et al. Probability of 50% reduction of nasal obstruction was 73% after 3 months according to Ho et al. The figure of 77 % improvement in nasal obstruction compares favourably with other studies such as 80% by Denholm et al10, 74% by Arunachalam et al11, 70.5% by Samad et al12, 82% by Newman et al13 and 75% by Buckland et al.1 The improvement in facial pain and catarrh is better than other studies. Outcome result for symptoms other than nasal obstruction varies considerably from other studies. According to Arunachalam et al 11, improvement in facial pain was 72%, and catarrh was 64% of patients. Buckland et al,1 says improvement of facial pain is 33% and Catarrh was 10% only. Significant improvement in nasal obstruction, catarrh & facial pain on linear analogue score after 2 months of surgery, was observed by Sanderson et al.14 Significant improvement of total nasal score in obstruction, sore throat & smell, but not much in headache was seen by Kantadinitis et al.15 In our study, improvement in other symptoms like, runny nose was 55%, sneezing 45%, facial pain 76%, cough 78%, epistaxis 80% and loss of smell 78%. These symptomatic improvements were comparable with other studies, but better than many of them. Our study concludes that septal surgery should be carried out for symptoms other than nasal obstruction also, in patients with deviated nasal septum.

Surgical treatment designed to eliminate mucosal contact pressure zones between the turbinate and septum can be effective in treating facial pain and headache. In our study, the total improvement was 76.6%. Sanderson and Rivron14 reported successful reduction of facial pain symptoms in a series of 60 patients undergoing septal surgery, although only 26 scored greater than 50 on a visual analogue scale from 0 to 100 pre-operatively. 90% had some degree of reduction in the symptom of facial pain. These patients had no plain X-ray evidence of sinus infection; however the authors did not report detailed rhinoscope findings, and did not mention the incidence of mucosal contact pressure zones. Novak,16 operated on 299 patients with migraine, cluster and idiopathic headaches, using a standard technique of septal correction, middle turbinectomy and ethmoido-sphenoidectomy. He states that 78.8% of patients were cured completely and 11.3% improved.

A question remains on long-term follow-up. One study showed that the benefits of septal surgery had dropped considerably from 73% to 27% after 9 years17 whereas another study showed that benefit is maintained up to ten years.18 Ideally, the follow-up should be longer but high drop-out rate and difficulty in follow-up makes this harder to achieve. So in our study, the patients were followed up after one month only.

**CONCLUSION:**

There is significant symptomatic improvement seen after septoplasty, when the pre-operative and post-operative scores were compared using SNOT-10 score. The improvement in the study group, i.e. cases who underwent septoplasty, is statistically highly significant. However, the symptomatic improvement in the control group, is not found to be significant. The comparison of results of the study group and control was found to be highly statistically significant. The improvements of the symptoms are not only seen for nasal obstruction, but also for sneezing and watery discharge, which are regarded as the symptoms of the rhinitis. So there is controversial subjective improvement seen in many rhinitic symptoms after septoplasty as well. High patient satisfaction has been seen in the patients undergoing septoplasty. SNOT-10 is a reliable tool to evaluate the improvement in symptoms after Septoplasty.

**REFERENCES:**

9. Ho WK, Yuen AP, Tang KC, Wei WI, Lam PK. Time course in the


IDENTIFICATION OF ALLERGENS BY SKIN PRICK TEST IN PATIENTS OF POKHARA SUFFERING FROM ALLERGIC RHINITIS

Objective: To evaluate the occurrence of etiological allergens by skin prick test in patients suffering from allergic rhinitis in Pokhara.

Material and methods: Allergic Rhinitis was diagnosed by consultant Otolaryngologist in Gandaki Medical College-Charak Hospital and Research Centre (GMC-CHRC) and Allergy test was done by skin prick method by the consultant Dermatologist at Padma Nursing Home, Pokhara.

Results: Total number of patients involved in the study was 67. The commonest allergen was house dust mite (D. farina 64%, D. pteronyssinus 61%, Blomia sp. 46%). Other allergens were dust (wheat 56%, silk 53%, cotton 50%, rice 49%, hay 47%), pollen (Mangifera indica 37%, Argemonemexicana 34%), insects (House fly 35%, moth 34%, red ant 32%), fungus (Candida albicans 31%, Fusariumsolani 28%). Majority of the patients had multiple allergens.

Conclusion: House dust mite was the most common allergen which was detected in 64% of the patients suffering from allergic rhinitis. Precautions to protect oneself from exposure to this house dust mites must be explained to all the patients suffering from allergic rhinitis.

Key words: allergic rhinitis, allergen, skin prick test

INTRODUCTION: Allergic rhinitis is best defined as that adverse pathophysiological response of the nose and adjacent organs, those results from the interaction of allergen with antibody in a host sensitized by previous exposure to that allergen. Allergic rhinitis has characteristic symptoms of watery nasal discharge, sneezing, itchy nose, and stuffy nose. It is due to allergic reaction to Aeroallergens including dust mites, pollens, animal dander and moulds.

Allergic rhinitis (AR) is a very common disease, affecting 10–25% of the population world-wide. One fourth of all the patients visiting our OPD has the features of allergic rhinitis. The management algorithm of allergic rhinitis is dependent on the identification of the etiologic allergen and symptom severity. The types of allergens, however, differ widely depending on localities.

There are no data about the possible pattern of causative offending allergens of our locality giving rise to allergic rhinitis. The present study therefore aimed at identifying the allergens that give rise to allergic rhinitis in Pokhara.

MATERIAL AND METHODS: Ethical clearance was taken from the ethical clearance committee of GMC-CHRC. Sixty seven (67) patients with symptomatic allergic rhinitis attending the OPD, Dept. of ENT, GMC-CHRC, Pokhara were included in the study. Diagnosis was made on the basis of history and physical examination. A detailed history was taken with reference to sneezing, itching, nasal discharge, nasal obstruction which are generally the chief symptoms of allergic rhinitis. Presence of pale or blue nasal mucosa and hypertrophied boggy turbinates with watery nasal discharge was considered in diagnosing the allergic rhinitis. These patients were subjected to skin prick allergy testing. Patients not willing to take part in study or unwilling to undergo allergy testing, taking steroids or antihistaminics for any disorders, and with active skin disorder were excluded from the study.

The tests were performed according to standard methods with allergens, histamine-positive and histamine-negative controls purchased from ALK-Abello (Denmark). The allergens used were mites, fungi, dusts, pollens, epithelia, insects and foods. The skin prick reaction was read at 15 minutes and considered positive when the reaction wheal diameter was at least 3 mm larger than the negative control. Data were collected and entered into Microsoft™ Excel™ 2007 and descriptive analysis was done with the help of SPSS™ 17.

RESULTS: Seventy eight patients diagnosed as allergic rhinitis were recruited for skin prick test. Of those, eleven patients were excluded as per criteria. Skin prick test was done in sixty-seven patients. The results are presented in Table-1.

Table 1: Distribution of most common allergens by SPT in patients with allergic rhinitis.

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Allergen</th>
<th>Types</th>
<th>Negative</th>
<th>Positive</th>
<th>Total</th>
<th>Positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D. farina</td>
<td>mites</td>
<td>24</td>
<td>43</td>
<td>67</td>
<td>64.17</td>
</tr>
<tr>
<td>2</td>
<td>D. pteronyssinus</td>
<td>mites</td>
<td>26</td>
<td>41</td>
<td>67</td>
<td>61.19</td>
</tr>
<tr>
<td>3</td>
<td>House Dust</td>
<td>dust</td>
<td>29</td>
<td>38</td>
<td>67</td>
<td>56.71</td>
</tr>
<tr>
<td>4</td>
<td>Grain Dust</td>
<td>Wheat</td>
<td>dust</td>
<td>29</td>
<td>38</td>
<td>67</td>
</tr>
<tr>
<td>5</td>
<td>Silk Dust</td>
<td>Raw</td>
<td>dust</td>
<td>31</td>
<td>36</td>
<td>65.73</td>
</tr>
<tr>
<td>6</td>
<td>CottonDust</td>
<td>dust</td>
<td>33</td>
<td>34</td>
<td>67</td>
<td>50.74</td>
</tr>
<tr>
<td>7</td>
<td>Grain Dust</td>
<td>Rice</td>
<td>dust</td>
<td>34</td>
<td>33</td>
<td>69.25</td>
</tr>
<tr>
<td>8</td>
<td>Hay Dust</td>
<td>dust</td>
<td>35</td>
<td>32</td>
<td>67</td>
<td>47.76</td>
</tr>
<tr>
<td>9</td>
<td>Spider web dust</td>
<td>dust</td>
<td>35</td>
<td>32</td>
<td>67</td>
<td>47.76</td>
</tr>
<tr>
<td>10</td>
<td>Blomia sp.</td>
<td>mites</td>
<td>36</td>
<td>31</td>
<td>67</td>
<td>46.26</td>
</tr>
<tr>
<td>11</td>
<td>Mangifera indica</td>
<td>pollen</td>
<td>25</td>
<td>26</td>
<td>51</td>
<td>51.96</td>
</tr>
<tr>
<td>12</td>
<td>House fly</td>
<td>insect</td>
<td>43</td>
<td>24</td>
<td>67</td>
<td>35.28</td>
</tr>
<tr>
<td>13</td>
<td>Argemonemexicana</td>
<td>pollen</td>
<td>44</td>
<td>23</td>
<td>67</td>
<td>34.32</td>
</tr>
<tr>
<td>14</td>
<td>Moth</td>
<td>insect</td>
<td>44</td>
<td>23</td>
<td>67</td>
<td>34.32</td>
</tr>
<tr>
<td>15</td>
<td>Ant (Red)</td>
<td>insect</td>
<td>45</td>
<td>22</td>
<td>67</td>
<td>32.83</td>
</tr>
<tr>
<td>16</td>
<td>Candida albicans</td>
<td>fungus</td>
<td>46</td>
<td>21</td>
<td>67</td>
<td>31.34</td>
</tr>
<tr>
<td>17</td>
<td>Fusariumsolani</td>
<td>fungus</td>
<td>48</td>
<td>19</td>
<td>67</td>
<td>28.35</td>
</tr>
<tr>
<td>18</td>
<td>Iscaemumindicum</td>
<td>pollen</td>
<td>48</td>
<td>19</td>
<td>67</td>
<td>28.35</td>
</tr>
<tr>
<td>19</td>
<td>Wheat Dust</td>
<td>dust</td>
<td>49</td>
<td>18</td>
<td>67</td>
<td>26.86</td>
</tr>
<tr>
<td>20</td>
<td>Amaranthuspinosus</td>
<td>pollen</td>
<td>49</td>
<td>18</td>
<td>67</td>
<td>26.86</td>
</tr>
<tr>
<td>21</td>
<td>Azadirachta indica</td>
<td>pollen</td>
<td>49</td>
<td>18</td>
<td>67</td>
<td>26.86</td>
</tr>
<tr>
<td>22</td>
<td>Dog Epithelia</td>
<td>epithelia</td>
<td>49</td>
<td>18</td>
<td>67</td>
<td>26.86</td>
</tr>
<tr>
<td>23</td>
<td>House fly</td>
<td>insect</td>
<td>49</td>
<td>18</td>
<td>67</td>
<td>26.86</td>
</tr>
<tr>
<td>24</td>
<td>Chenopodiummural</td>
<td>epollen</td>
<td>50</td>
<td>17</td>
<td>67</td>
<td>25.37</td>
</tr>
</tbody>
</table>
**DISCUSSION:**

House dust mites were the most common allergen detected by skin prick test. Allergy to D. farinae was found in 64%, D. pteronyssinus in 61%, Blomia sp. in 46%. Dust was the second common allergen. Wheat dust was positive in 56%, silk dust in 53%, cotton dust in 50%, rice dust in 49%, hay dust in 47%, Spider web dust in 47%, wheat dust in 26%. Pollen was the next common allergens. Pollens of Mangiferaindica were 37%, Argemonemexicana were 34%. Others allergen were insects (House fly 35%, moth 34%, red ant 32%) and fungus (Candida albicans 31%, Fusariumsolani 28%). Majority of the patients had multiple allergens. D. farina and D. pteronyssinus were the most common mites found in our study. This finding was similar to a study done in Massachusetts, USA. Similarly in North Iran, the hypersensitivity to house dust mites is very common. Similar was the result in South India too. Nepal is an agricultural country. Most of the people are exposed to pollens of agricultural products. Mango (Magniferaindica) was the most common pollen which was found in the test. As majority of the patients suffering from allergic rhinitis were reactive to house dust mite allergen, they should be advised for the general prevention from exposure to the house dust. In the mean time, avoidance to other allergens and use of medicine should also be practiced to alleviate the symptoms.

**CONCLUSION:**

House dust mite allergy was found in two-thirds of the patients suffering from allergic rhinitis. All the patients suffering from this disease should be advised for the general prevention from exposure to the house dust in addition to avoidance of other possible allergens and use of medicine to relieve the symptoms.

**REFERENCES:**

ANALYSIS OF TASTE DISTURBANCES IN PATIENTS BEFORE & AFTER MASTOID SURGERY

OBJECTIVES:
To observe the frequency of taste disturbance in all patients undergoing mastoid surgery and to correlate between peroperative status of chorda tympani nerve (CTN) and type of peroperative CTN injury with postoperative taste disturbance.

MATERIALS AND METHODS:
A prospective analysis of patients who underwent mastoid surgery over 18 months period in Ganesh Man Singh Memorial Academy of ENT and Head & Neck Studies, TU Teaching Hospital, Kathmandu, Nepal. The peroperative status of CTN and different types of peroperative CTN injuries were also noted and categorized. Subjective assessment of taste disturbance was categorized as altered taste sensation/metallic taste, tongue numbness, absence of taste sensation and dry mouth.

RESULTS:
All patients did not have any preoperative taste disturbance. On the 2nd postoperative day (POD), taste disturbances were found in 13 patients (11.5%), out of which 10 patients (76.96%) had numbness and 3 patients (23.07%) had absence of taste sensation. On the 10th POD the finding was similar as previous. However, two months after surgery, only one patient (7.69%) remained symptomatic. This symptomatic patient also recovered his taste sensation after 4th months of surgery. Out of these 13 patients who developed postoperative taste disturbances, in 5 patients (38.46%) CTN was not found/not identified. Remaining 8 patients, in whom the CTN was found/identified, in 5 patients (38.46%) it was clean cut with micro-scissors, in whom 4 patients had numbness of tongue and 1 patient had absence of taste sensation. Remaining 2 patients in whom the CTN was cut while using burr, both patients developed numbness of tongue and the single remaining patient in whom the CTN was stretched but preserved, the patient also developed numbness of tongue (p>0.05).

CONCLUSION:
No patients in this study suffered from taste disturbance before mastoid surgery despite of the fact that, in 44 patients (39%) the CTN was not identified at the time of surgery. Postoperatively taste disturbance was found in 13 patients (11.5%), among them in 10 patients (76.92%) the disturbance was in the form of numbness.

KEY WORDS: chorda tympani nerve (CTN), mastoid surgery, taste disturbance

INTRODUCTION:
Taste is one of the 5 basic special senses in the human body. Taste buds are the sense organs for taste and located in the walls of fungiform and vallate papillae of the tongue. The CTN, a branch of facial nerve carries taste sensation from the anterior 2/3 of tongue. Mastoid surgery is a common surgery in otolaryngology practice. The purpose of doing this surgery is to make the ear safe and dry, to prevent the complications and to preserve the hearing as far as possible.

The CTN is vulnerable to have different types of injuries during mastoid surgery, especially during elevation of the tympanomeatal flap, removal of the disease process and drilling of the posterior canal wall. The injury can range from just being stretched, clean cut or cut while using the burr. Occasionally the CTN may not be identified due to various reasons. CTN injury in mastoid surgery is common but postoperative taste disturbances have not generally been appreciated both by patients as well as by otologists. The taste disturbances can be in the form of a metallic taste, bitter, salty, sour, dryness of mouth and numbness of tongue.6 This study will help medical personnel to counsel patients regarding taste disturbance preoperatively due to the existing disease process and postoperatively due to injury to the CTN.

MATERIALS AND METHODS:
This was a prospective, analytical and longitudinal study. The study was conducted in Ganesh Man Singh Memorial Academy of ENT and Head & Neck Studies, Tribhuvan University Teaching Hospital (TUTH), Kathmandu, Nepal for a period of 18 months, from 1st October 2007 to 30th March 2009. Patients of age more than 12 years, either sex and undergoing all mastoid surgeries including revision surgeries were also included in this study. Excluded cases were patients with mental retardation, with altered taste due to other medical conditions like diabetic mellitus, suffering from neurological and psychiatric diseases, who had history of surgery on the tongue and salivary glands, having facial nerve palsy (preoperative and postoperative), patients on drugs that may cause taste disturbances such as: ACE inhibitors, amphetamines, benzodiazepines, ethambutol, cisplatin, carbamazepine, metformin, metronidazole, propanolol, streptomycin, carboplatin, clarithromycin, beta-lactam antibiotics, sulfasalazine, tetracyclines, furosemide, nilfipidine, losartan and olfoxacin. One day prior to surgery, patients were asked about any of the following type of taste disturbances: altered taste/metallic taste, numbness of tongue, dryness of mouth and absence of taste sensation. In this study subjective assessment of taste disturbance was done based on a questionnaire developed used by Nin et al11 but with some modification. The type of CTN injury during mastoid surgery noted in this study was based on Gopalan et al8 with certain modifications. In our study, the type of injury to the CTN during mastoid surgery were noted as: CTN found/identified or not found/not identified, stretched, deliberately cut with micro scissors or cut while using burr. Postoperatively patients were asked about their taste sensation. The first assessment of taste sensation was carried out at the time of 1st dressing, i.e., 2nd post-operative day, then on 10th postoperative day and finally on 2 months after surgery. However, only those patients who had taste disturbances at the end of 2nd month postoperatively were followed up to 4th month.

RESULTS:
A total of 139 mastoid surgeries were done during our study period. Out of these 139 patients, 113 patients were included while 26 patients were excluded from the study. Among these 113 included patients, 65 were male and 48 were female. The mean age was 23.76 years. All 113 patients who underwent mastoid surgery did not have any preoperative taste disturbance. Altogether 13 patients developed postoperative taste disturbance. They were classified in two groups: Group A- Patients with postoperative taste disturbance in whom the CTN was not found. Group B- Patients with postoperative taste disturbance in whom the CTN was found.

Out of 5 patients, belongs to Group A, 3 patients had tongue numbness.

Fig: 1. Pie chart showing types of peroperative CTN injury

Types of peroperative chorda tympani nerve injury

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean cut with micro-scissors</td>
<td>29 (42%)</td>
</tr>
<tr>
<td>Cut while using burr</td>
<td>3 (4%)</td>
</tr>
<tr>
<td>Stretched but preserved</td>
<td>38 (55%)</td>
</tr>
</tbody>
</table>
of injury was clean cut with micro scissors: 38 patients (55.07%) which was followed by cut while using burr in 29 patients (42.02%) and stretched but preserved in 2 patients (2.89%).

It is interesting to note here that although surgery in 44 patients (39%) CTN was not found, but none of these patients had taste disturbance preoperatively. That could be due to damage of the different middle ear structures like ossicles, nerve, etc by inflammatory changes. Landis et al reported that changes in the taste sensation of the tongue, on the ipsilateral side of chronic inflammatory middle ear disease proceed unnoticed by the patients. That could be the reason that none of the patients included in this study complained of taste disturbance preoperatively. All patients were specifically asked for any taste disturbances as they did not voluntarily complain about it. Similar subjective assessment have been implied in other studies done by Gopalan et al, Micheal et al, Sone et al and Sakagami et al.

In the literature, the post-operative symptoms of taste disturbance vary from 15 to 31%, Gopalan et al and Clark et al. In our study, frequency of CTN injury was high 61.06%. However, 11.59% developed immediate postoperative taste disorder. Our study showed a comparatively lower percentage of symptomatic patients than found in rest of the literature. According to Clark et al, because of the chronic disease process of cholesteatoma leads to gradual hypofunction and patient is not aware of further postoperative taste disturbance following CTN injury.

In our study, none of the patients were aware of symptoms until they were asked about taste disturbance specifically. Contrary to this study, in the study done by Gopalan et al and Mahendran et al, patients complained of taste disturbances following middle ear surgery without being specifically asked for it.

In this study, 11.50% developed taste disturbance after mastoid surgery. The most common taste disturbance was numbness of tongue 76.86%. Another was absence of taste 23.07%. None of the patient complained of metallic taste and dry mouth. Similarly Nin et al also found numbness in 58%. But Clark et al and Micheal et al found the commonest taste disturbance was metallic taste sensation.

In our study, there were 44 patients where chorda tympani nerve was not found. Among these 44 patients, 5 patients (38%) were symptomatic even when the chorda was not found. The most likely cause that can be assumed is that, CTN was present and unknowingly injured during surgery. Saito et al suggested that the CTN could have been unknowingly touched or tugged without the surgeon being aware of its existence in the surgical field.

**CONCLUSION:**
None of the 113 patients with COM squamous active type were found to have taste disturbance before mastoid surgery. Postoperatively, taste disturbance was found in only 11.50%. However, none of the patients voluntarily complained of postoperative taste disturbance. They complained of taste disturbance only after being asked for it by the doctor. The most frequent type of CTN injury during mastoid surgery was clean cut with micro scissors. Numbness of the tongue was the most common taste disturbance found after mastoid surgery. Taste disturbance was encountered in 38% patients in whom CTN was not found. Among the CTN identified cases, CTN was clean cut with micro scissors in 38% patients, CTN was cut while using burr in 15% patients and CTN was stretched but preserved in 8% patients. However, these findings were statistically not significant. Hence there is no direct relation between postoperative status of CTN findings and type of CTN injury with postoperative taste disturbance.

**REFERENCES:**


STUDY OF NERVE INJURY IN PAROTID GLAND SURGERY

Objective:
To find out the frequency of nerve injuries after parotid surgery

Material and methods:
A Cross sectional study was done from January 2008 to December 2009, in the Department of Otolaryngology and Head Neck Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU) & Dhaka Medical College Hospital (DMCH), Dhaka. Thirty patients with parotid gland diseases underwent surgical treatment were selected for this study by convenient, purposive, none randomize sampling. The patients were followed up for one year after surgery and evaluated the status of the nerve injury (temporary or permanent).

Results:
Out of 30 cases, superficial parotidectomy was done in 23 (76.67%) patients and total conservative parotidectomy was done in 7 (23.33%) patients. In this study, 23 (76.67%) patients had benign tumours, 5 (16.67%) patients had malignant tumours and 2 patients had inflammatory disease. Most of the benign parotid tumours were pleomorphic adenoma (73.33%). Majority of the pleomorphic adenomas involved the superficial lobe (90.91%) of the gland. Immediately after operation we observed facial nerve injuries in 11 patients and great auricular nerve injuries in four patients. In this series, 26.67% developed temporary facial palsy, whereas 10% developed permanent facial palsy. Marginal mandibular branch of the facial nerve was the most commonly injured (16.33%) nerve. Temporary great auricular nerve palsy was observed in 10% where as permanent paralysis was observed in 3.33%. Frey’s syndrome was found in 4.34%.

Conclusion:
Most patient regained normal facial nerve functions between one and six months after surgery. This observation has important implications for the management of post parotidectomy facial nerve palsy. Temporary facial nerve paresis is the cosmetic problem and patients should be assured that their appearance would return to normal.

Key words: parotidectomy, facial paresis, pleomorphic adenoma

INTRODUCTION:
Tumors of the parotid glands are believed to represent approximately 2% of tumors of the head and neck. Parotid gland tumors also accounts for 70% to 80% of all tumors of the salivary glands.1 Approximately, 80% of parotid tumors are benign and 80% of benign tumours are pleomorphic adenomas and 80% arise from the superficial lobe of the parotid gland.2 Less commonly, tumours may arise from the accessory lobe of the gland and present as a persistent swelling in the cheek. Rarely, tumours may arise from the deep lobe of the parotid gland and present as parapharyngeal masses.3 The facial nerve is a very important nerve which exits through the skull base, below the ear lobe and travels through the parotid gland, separating the gland into superficial and deep lobes.4 The hazardous course of the facial nerve through the parotid has evoked considerable risk of nerve injury.5 The incidence of facial nerve paralysis is higher in total than in superficial parotidectomy, which may be related to stretch injury or as a result of surgical interference with the vasa nervorum. Among the branches of facial nerve which is the most at risk for injury during parotidectomy, is the mandibular branches.5 Parotid duct ligation increases the risk of nerve palsy in the distribution of zygomatic and buccal branches. Operations for Warthin’s tumour were associated with the increased risk of dysfunction of the cervical branches of the facial nerve.6 Advanced age, longer operation time and larger specimen will have the significant risk for transient facial palsy after conservative parotidectomy.7

There are two basic techniques for the identification and dissection of the facial nerve. One is the forward or antegrade dissection, where the approach to the main trunk is taken as an early step of tracing it to the bifurcation and peripheral branches. Retrograde dissection of the facial nerve is more popular in china with encouraging results.1 Function preserving parotid surgery has relatively low complication rate like the use of a modified facelift incision, preservation of the great auricular nerve and normal parotid parenchyma. Ear sensation returned more rapidly and more complete sensations regained in the posterior branch of the great auricular nerve is preserved than in those in whom the nerve is sacrificed.8 The auriculotemporal nerve provides both parasympathetic innervations to the parotid gland and sympathetic innervations to sweat glands and subcutaneous blood vessels. Frey’s syndrome is due to regrowth of the secretomotor parasympathetic fibers into the distal cutends of the sympathetic fibers into the skin.9 The objective of this study is to find out the frequency of nerve injuries after parotid surgery.

MATERIAL AND METHODS:
A Cross sectional study was done from January 2008 to December 2009 in the Department of Otolaryngology and Head Neck Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU) & Dhaka Medical College Hospital (DMCH), Dhaka. Thirty patients with parotid gland diseases who underwent surgical treatment for their pathology were selected for this study by a convenient, purposive and non randomize sampling method. The patients were followed up for one year after operation and evaluated the status of the nerve injury whether it was temporary or permanent. Written informed consent was taken from the patients or attendants after discussion prior to surgery. We included all patients with parotid gland diseases who received surgical treatment and excluded those parotid gland diseases who had facial nerve palsy along with the disease. In all radical and extended radical parotidectomy cases, nerve was sacrificed purposefully. Data was analyzed by using standard statistical methods. Results were analyzed and evaluated by using proper tests of significance (Z test & χ² test) which were presented in following table.

RESULTS:
In this study, mean age of the patients was 40.63 years, SD± = ±16.25. Male to Female ratio was 1:1.4. Histologically, there were 22 cases of pleomorphic adenoma, five cases of mucoepidermoid carcinoma, two cases of chronic sialoadenitis and one case of Warthin’s tumour. Location of benign parotid diseases among the study population (n=22) showed that out of 22 cases, 20 (90.91%) cases involved the superficial lobe where as two (9.09%) cases involved the deep lobe. Statistically pathology of superficial lobe was significantly higher than the deep lobe of the parotid gland(Z= 11.03, p < 0.001). Out of 23 cases of superficial parotidectomy, facial nerve palsy was observed in six cases where as great auricular nerve palsy was observed only in two cases (Table-1). Among the facial nerve palsy group, five cases had temporary palsy and one case had permanent palsy, whereas in great auricular nerve palsy group all cases had temporary palsy (Table-1). Among seven cases of total conservative parotidectomy, facial nerve palsy was observed in five cases and great auricular nerve palsy was observed in two cases (Table-2). Among these facial nerve palsy group, three cases had temporary palsy and two cases had permanent palsy, where as in great auricular nerve palsy group only one case had both temporary and permanent palsy (Table-2). In contrast, out of five cases of mucoepidermoid carcinomas (low grade), four cases had facial nerve injury and one case had great auricular nerve injury (Table-3).
Table 1. Study of nerve injury after superficial parotidectomy (n=23)

<table>
<thead>
<tr>
<th>Nerve injury</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial palsy</td>
<td>6</td>
<td>26.08%</td>
</tr>
<tr>
<td>Temporary</td>
<td>5</td>
<td>21.73%</td>
</tr>
<tr>
<td>Permanent</td>
<td>1</td>
<td>4.34%</td>
</tr>
<tr>
<td>Great auricular nerve palsy</td>
<td>2</td>
<td>8.69%</td>
</tr>
<tr>
<td>Temporary</td>
<td>2</td>
<td>8.69%</td>
</tr>
<tr>
<td>Permanent</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frey’s syndrome</td>
<td>1</td>
<td>4.34%</td>
</tr>
</tbody>
</table>

Table 2. Study of nerve injury after total conservative parotidectomy (n=07)

<table>
<thead>
<tr>
<th>Nerve injury</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial palsy</td>
<td>5</td>
<td>71.43%</td>
</tr>
<tr>
<td>Temporary</td>
<td>3</td>
<td>42.86%</td>
</tr>
<tr>
<td>Permanent</td>
<td>2</td>
<td>28.57%</td>
</tr>
<tr>
<td>Great auricular nerve palsy</td>
<td>2</td>
<td>28.57%</td>
</tr>
<tr>
<td>Temporary</td>
<td>1</td>
<td>14.28%</td>
</tr>
<tr>
<td>Permanent</td>
<td>1</td>
<td>14.28%</td>
</tr>
<tr>
<td>Frey’s syndrome</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3. Distribution of diseases in relation to nerve injury (n=30)

<table>
<thead>
<tr>
<th>Nature of disease</th>
<th>No. of patients</th>
<th>No. of Facial nerve injury &amp; relating percentages</th>
<th>No. of Great auricular nerve injury &amp; relating percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleomorphic adenoma</td>
<td>22</td>
<td>6 (27.27%)</td>
<td>2 (9.09%)</td>
</tr>
<tr>
<td>Warthin’s tumour</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chronic sialoadenitis</td>
<td>2</td>
<td>1 (50%)</td>
<td>0</td>
</tr>
<tr>
<td>Mucoepidermoid ca (low grade)</td>
<td>5</td>
<td>4 (80%)</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>11</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 4. Different branches of facial nerve injury following surgery

<table>
<thead>
<tr>
<th>Type</th>
<th>Branches</th>
<th>No. of patients</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single branch</td>
<td>Temporal</td>
<td>01</td>
<td>0.1%</td>
</tr>
<tr>
<td>Zygomatic</td>
<td>Nil</td>
<td>05</td>
<td>0.5%</td>
</tr>
<tr>
<td>Buccal</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Marginal mandibular</td>
<td>3.33</td>
<td>3.33</td>
<td>0.33%</td>
</tr>
<tr>
<td>Cervical</td>
<td>16.67</td>
<td>16.67</td>
<td>1.67%</td>
</tr>
<tr>
<td>Multiple branches</td>
<td>Marginal mandibular &amp; zygomatic</td>
<td>02</td>
<td>6.67</td>
</tr>
<tr>
<td>All branches</td>
<td>All</td>
<td>03</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

Out of 30 parotid surgeries, 11 patients had facial nerve injury and among them, three patients had injury of all branches. Remaining six patients had single branch injury and two patients had multiple branch injury (Table 4). Out of 23 cases of superficial parotidectomy, six patients had facial nerve injury and among these six cases, five cases had temporary palsy and one case had permanent palsy. Out of seven cases of total conservative parotidectomy, five cases had facial nerve injury and among these five, three cases had temporary palsy and two cases had permanent palsy. The difference of facial nerve injury between superficial parotidectomy and total conservative parotidectomy is statistically significant (Table 5). (Z= 2.34, p < 0.05)

It is evident from Table 6 that, the total number of permanent facial palsy was three. Out of these three, two cases had total paralysis and another one had single branch palsy (Marginal mandibular nerve). Total number of permanent great auricular nerve palsy was only one. In superficial parotidectomy, facial nerve injury was observed in six patients whereas the great auricular nerve injury was observed only in two cases. In total conservative parotidectomy, facial nerve injury was observed in five patients and the great auricular nerve injury was observed only in two cases (Table 7).

**DISCUSSION:**
In this present series, 30 cases of parotid gland surgery were studied. Out of these 30 cases, 11 patients developed facial nerve palsy immediately after operation where as four patients developed great auricular nerve palsy. These patients were followed up for one year after surgery and re-evaluated the status of nerve palsy to detect whether it was temporary or permanent palsy. The results obtained in this series were compared with other national and international studies. In a series, in case of parotid tumour, superficial lobe was involved in 90% of the patients where as the deep lobe was involved only in 10% of the patients. In our study, 90.91% of the patients had pleomorphic adenoma in their superficial lobe of the parotid where as only in 9.09% of the patients had in their deep lobe. So this study is consistent with the above study. Statistical analysis of our study showed that superficial lobe involvement is significantly higher (Z= 11.03, p < 0.001) than the involvement of deep lobe. In a study by Tsai HM et al mentioned that in case of parotid tumours, 85% are benign tumours and only 12% are the malignant one. In our study also we found 83.33% were benign and only 16.67% were malignant. Therefore our results are comparable with the results of these authors. We
performed statistical analysis of our findings which showed that the frequency of benign tumours was significantly higher ($Z = 6.91, p < 0.001$) than the malignant one. In our study, superficial parotidectomy was performed in 23 (76.67%) patients and total conservative parotidectomy was performed in seven (23.34%) patients. Out of these seven patients, two (6.67%) patients of benign tumour had involved the deep lobe of the parotid and remaining five (16.67%) patients having malignant tumours but without the involvement of the facial nerve. These findings were statistically analysed which showed that superficial parotidectomy is performed significantly higher ($\chi^2 = 19.78, df = 1, p < 0.001$) than the other parotid surgery.

The most common benign parotid tumours were pleomorphic adenoma (84%) followed by Warthin’s tumour (10%). In our study also, the most common benign parotid tumour was pleomorphic adenoma (73.33%) followed by Warthin’s tumour (3.33%) which is contradicted to the results of previous study. Statistical analysis of these observations showed that pleomorphic adenoma was common benign tumour ($Z = 8.04, p < 0.001$) than the other benign tumours. In our series, out of 30 cases studied, superficial parotidectomy was performed in 23 (76.67%) patients. Among them, facial nerve injury was noted in six (26.08%) patients and great auricular nerve injury was noted in two (8.69%) patients. Out of these six cases of facial nerve injury, five (21.73%) cases had temporary palsy and one (4.34%) case had permanent palsy even after follow up of one year. On the other hand, two cases of great auricular nerve injury were temporary in nature. Total conservative parotidectomy was performed in seven (23.34%) patients. Among them, facial nerve injury was noted in five (71.43%) patients and great auricular nerve was in two (28.57%) patients. Out of these five patients of facial nerve injury, three (42.86%) patients had temporary palsy and two (28.57%) patients had permanent palsy. On the other hand, two cases of great auricular nerve injury, one (14.28%) case had temporary palsy and one (14.28%) had permanent palsy. The difference of facial nerve injury in between superficial parotidectomy and total conservative parotidectomy is statistically significant ($Z = 2.34, p < 0.05$). In a study it is mentioned that, temporary facial nerve palsy was occurred in all (26.67%) and one or two branches (18.88%) of the facial nerve. The permanent total paralysis occurred in 10% of the case and branches in 3.3% of the cases. Here we found that temporary facial nerve paresis involving all or just one or two branches of the facial nerve and permanent total paralysis occurred in 9.3% to 64.6% and in 0% to 8% respectively. So, the result is similar to above study. The branch of the facial nerve most at risk for injury during parotidectomy is the marginal mandibular branch. In our study, we found five (45.46%) patients had marginal mandibular injury. So the result is comparable with the above study. The incidence of Frey’s syndrome after parotidectomy has been reported from 10 to 15%. In our study, 4.34% patients were presented with Frey’s syndrome. This result is not similar to the above study, it could be just because of patients could not noticed the syndrome. Full recovery of facial nerve function occurred between one and six months after operation. In another study it was mentioned that most of the patients with post operative facial nerve paresis, regained their normal function within 12-14 months after surgery, regardless of the pathology and that a slower recovery occurred for up to two years after surgery. In this study, majority of patients showed significant functional recovery within three months after the surgery and all recovery occurred within six months after surgery.

**CONCLUSION:**

Nerve injury is more common in total conservative parotidectomy than in superficial parotidectomy. The best means of reducing iatrogenic facial nerve injury, in parotid gland surgery, still remains a clear understanding of the anatomy, good surgical technique with the use of multiple anatomic land marks and the use of modern instruments like harmonic scalpel and nerve monitor. The goals, rationale and risk of the operation such as the complications associated with the surgical procedure must be clearly explained. Early detection of nerve injury, is quite helpful to reduce the facial deformity by early reconstruction and other procedures.

**REFERENCES:**

OUTCOME OF ENDOSCOPIC DCR AT TUTH

B. Pradhan
Ganesh Man Singh Memorial Academy of ENT and Head & Neck Studies
T U-Teaching Hospital, Maharajgunj, Kathmandu, Nepal.

Correspondence to:
Prof. Bibhu Pradhan
Unit Chief, Rhinology Unit
Ganesh Man Singh Bhawan
TU Teaching Hospital, Maharajgunj, Kathmandu, Nepal
E- mail: bibhuduga@yahoo.com

INTRODUCTION:
Although the external DCR is thought to be gold standard for chronic dacyrocystitis, EDCR is getting popular worldwide because of its many advantages.1 After the advent of nasal endoscopy, it became possible to approach the operation from nasal side, thereby avoiding facial scar and unnecessary dissection of orbitociliar muscle and orbital peristium. External DCR was first proposed by Caldwell in 1893 and developed by West in 1910.2 In 1992, Mc Donogh performed first endoscopic transnasal DCR.3 After that, this procedure has been practiced by ENT surgeons of all over the world with some surgeons claiming success rate more than 90% in the experienced hand.

The reason behind publishing this article is, though EDCR is frequently done procedure in many countries and many articles have been published with high success rate of this procedure, but in Nepal this surgery is done in very few centres and no article has been published till date to our knowledge. All patients of chronic dacyrocystitis cannot undergo EDCR; there are certain indications like distal obstruction in the lacrimal pathway and obstruction at the nasolacrimal duct, which is confirmed by simple test like eye irrigation and probe test. On irrigation, if there is reflux from the opposite punctum and on probe test if we find hard stop, these patients will be benefited from EDCR. Obstruction at the upper lacrimal pathway, which is confirmed by the probe test, if it shows soft stop or if we suspect neoplasm or dacryolithiasis, these cases are contraindicated for EDCR.4

There are many advantages to EDCR,4-5 like no external scar, excellent visualization of intranasal structures, can be done at the same sitting, preserves the pumping mechanism of orbitociliar oculi muscle, simultaneous nasal surgeries for other nasal pathologies are possible and minimal bleeding, so shorter operation time.

Causes of failure of external DCR reported in literature are: deviated nasal septum, chronic rhinosinusitis, presence of prominent aganeri cells, small intranasal ostium and intranasal synechiae.6

MATERIALS AND METHOD:
This study was conducted at the Ganesh Man Singh Memorial Academy of ENT-Head and Neck Studies, TU- Teaching Hospital, Kathmandu, Nepal, from March 2005 to February 2011. Total number of 75 EDCR was performed during this period.

All 75 patients underwent EDCR under GA. Dilatation of punctum and probing was done to confirm the diagnosis. Local infiltration of 2% xylocain with adrenaline was injected at the axilla of middle turbinate. Incision was made anterior to uncinate process, mucoperiostal flap was elevated posteriorly upto uncinate process, lacrimal bone was palpated and was removed by lacrimal punch or coarse diamond bur. It is important to remove bone superiorly upto common cicionalus and inferiorly upto the nasolacrimal duct. The sac was made prominent by injecting little saline and it was opened from superior to inferior using sickle knife and with the help of ball probe. Adhesion inside the sac was released, anterior and posterior flap of the sac was reflected and abgel was kept in between the flaps. No packing was required. All patients were advised to have: Ciprofloxacin 500 mg BD for10 days, Ibufrofen 400 mg TDS, after food, for three days. Steroid eye drop in tapering dose was given for one week and followed up as per our follow up criteria. All follow up were done with nasal endoscope which was done after one week to remove the blood clot and to release the adhesions if present.

RESULTS:
During our study, we analyzed not only the outcomes of EDCR and factors causing failure of EDCR but also analyzed nasal pathology of all patients during endoscopic evaluation prior to surgery and found that out of 75 patients, who underwent EDCR, 31 patients had nasal pathology.

Table 1. showing preoperative nasal pathology

<table>
<thead>
<tr>
<th>Nasal pathology</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviated nasal septum(DNS)</td>
<td>20</td>
<td>26.6</td>
</tr>
<tr>
<td>Concha bullosa</td>
<td>5</td>
<td>6.6</td>
</tr>
<tr>
<td>Chronic Rhinosinusitis</td>
<td>5</td>
<td>6.6</td>
</tr>
<tr>
<td>Nasal polyps</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Total No. of Pts</td>
<td>31</td>
<td>41.2</td>
</tr>
</tbody>
</table>
pathology which is mentioned in table 1. Out of 20 DNS patients, only 8 patients with high DNS needed correction therapy and one patient of nasal poly needed FESS which was done at the same sitting.

Age of the patients ranged from 18 yrs to 60 yrs. Out of 75 patients, 35 were male and 40 were female. All 75 patients came for follow up regularly after one week, 3 months, 6 months and one year respectively as per our instruction. There were no major complications noted during surgery or in post operative period of EDCR. Minor complications noted were mentioned in table 2.

Out of seven patients, two had upper lacrimal pathway obstruction and were referred to ophthalmologist. In remaining in five patients’ cause of recurrence of epiphora could not be found out. Among these five patients two patients underwent revision EDCR and three patients wanted to wait and later lost to follow up. Three patients, who had granuloma formation at the site of sac opening, needed endoscopic excision of granuloma. Synchiae formation was noted in five patients, which was released endoscopically.

DISCUSSION:
Chronic dacryocystitis is one of the commonest causes of epiphora. External DCR was the standard surgical procedure for most of the years in 20th century, but external DCR has failure rate ranging from 3 – 15%.6 After the advances in the nasal endoscopic surgery, EDCR has gained popularity. EDCR has many advantages like avoids external scar, preserves pumping action of orbicularis oculi muscle, can be performed during active phase of infection of the lacrimal sac, which is a relative contraindication for external DCR.4,5,6-8 We found that it was not necessary to use silicon tube in all cases of EDCR, similar results were shown in other studies too.9,10 Umer et al performed 256 EDCR from 1994 to 2002, out of which 55 cases (21.5%) required additional endonasal procedure.11 Devi Prasad et al found that out of 24 patients 6 patients had concomitant nasal pathology which needed endonasal procedure.12 In our study, out of 75 patients 31 patients (41.3%) had other nasal pathology, some of which needed correction. Ramkrishnan et al performed 27 EDCR in 20 patients from 2003 to 2006, where they claimed 100% success rate for anatomic patency and 93% for complete resolution of epiphora.1 Devi Prasad et al found success rate of 90% in control of epiphora.12 In our study, we found success rate of (80%) in control of epiphora.

In another unpublished study, done in the Dept. of Otorhinolaryngology and Ophthalmology at TU-Teaching Hospital, to compare the EDCR with that of external DCR, it was found that in EDCR out of 27 patients duct were found to be patent in 24, where as in external DCR group out of 32 patients, duct were found to be patent in 29 patients. The conclusion was that the success rate of EDCR is comparable to that of external DCR. There are other studies which show the similar results.13,14,16

REFERENCES:
Case Report

DK Chhetri
Division of Head and Neck Surgery, 62-132 CHS, UCLA Medical Center, Los Angeles, CA 90095, USA

Correspondence to:
Dinesh K. Chhetri, M.D.
62-132 CHS, Div. Head & Neck Surgery, Los Angeles, CA 90095 USA
E-mail: dchhetri@mednet.ucla.edu

BENIGN AND MALIGNANT LIPOGENIC TUMORS OF THE RETROPHARYNGEAL SPACE

Lipogenic tumors of the retropharyngeal space are neoplasms that can grow to a considerable size before becoming symptomatic. Careful inspection of preoperative imaging will heighten suspicion for malignancy, which is critical in planning treatment. In this study we compare clinical, radiologic, and histologic findings of benign and malignant lipogenic tumors of the retropharyngeal space.

Key words: lipogenic tumor, retropharyngeal

Introduction:
Lipoma is a common benign mesenchymal soft tissue tumor, which may arise within any site of the body. It occurs in the head and neck region in about 13% of all cases. It typically presents as a soft, mobile, subcutaneous mass without significant symptoms and is treated with simple excision. Lipomas of the retropharyngeal space are rare. Yoshihara et al. identified twenty-six cases previously reported in the literature. There are many histopathologic subtypes, but microscopically are conventionally seen as a thinly encapsulated aggregate of mature adipocytes. In fact, it is commonly challenging to distinguish healthy adipocytes from adenomatous cells. Liposarcoma is the one of the most common sarcomas of adulthood. The head and neck region constitutes approximately 3% of all locations. Retropharyngeal liposarcomas are rare, with only 8 prior reported cases. This includes one case of suspected radiation induced sarcomatous transformation. There are 5 pathologic subtypes, each with their differing prognosis. Treatment is primarily surgical with prophylactic nodal dissection. Chemoradiation therapy is added for poor histologic characteristics or positive surgical margins. At our academic institution we have had the unique experience of treating both lipoma and liposarcoma of the retropharyngeal space and noted the similarities of the clinical presentations as well as the radiographic differences. A retrospective chart review was completed to identify illustrative cases. We present these cases and compare and contrast clinical, radiographic, and pathologic findings of a retropharyngeal lipoma with a retropharyngeal liposarcoma.

Case Reports:
Case 1: A 66-year-old African American female initially presented to an outside hospital with a one-month history of progressive dysphagia and airway obstruction. She was admitted and her workup included computed tomography (CT) of the neck showing a retropharyngeal mass. She was discharged with outpatient follow up with an otolaryngologist. The patient re-presented to the emergency room a few weeks later with complaints of neck fullness, further difficulty with breathing, and dysphagia. A repeat CT again showed the mass and also a marked narrowing of the supraglottic airway. She underwent a tracheostomy and an incisional biopsy. Because of her increasing dysphagia, the patient also had a percutaneous gastrostomy tube placed. The biopsy was consistent with lipoma. The patient was subsequently transferred to our institution. The CT neck revealed a large retropharyngeal space mass (6.2 cm anteroposterior, 9.1 cm transverse, and 14.0 cm craniocaudal) centered at the level of the hyoid bone with anterolateral herniation of the mass into the left submandibular space (Fig.1).

This homogeneous mass with fatty attenuation had occasional very fine hair-like septae noted within the center. The overall appearance was consistent with a lipoma. Her comorbid medical problems were optimized and she was taken to the operating room where a transcervical resection of the retropharyngeal mass was performed. There were no complications. Pathology confirmed a 10 x 9 x 4.8 cm lipoma without atypia (Fig. 2).

Fig: 1. CT scan of patient with large retropharyngeal mass (*) with slight herniation into the left neck. The fatty attenuation and homogeneity of the mass is consistent with a lipoma.

Fig: 2. Excised mass seen in Figure 1. Histopathology was consistent with a lipoma.
She did well following the surgery, and her tracheostomy tube was removed on the fourth postoperative day. She had no respiratory distress during her hospitalization and steadily regained normal vocal amplitude and quality over the course of her hospitalization. On postoperative day six she passed a bedside swallow study and was started on a regular diet which she tolerated without difficulty. Her PEG tube was subsequently removed and she has been asymptomatic after a 4-year follow-up.

Case 2: A 57-year-old Asian female presented to her primary doctor with a two month history of a rapidly enlarging left neck mass associated with dyspnea and dysphagia. On examination a left neck mass was appreciated and an urgent CT scan was ordered. The CT scan revealed a 2.5cm anteroposterior, by 6.5cm transverse, by 12.5cm craniocaudal mass from the level of the oropharynx extending to the mediastinum with pronounced tracheal shift (Fig:3).

The mass dissected between fascial planes to bilateral neck spaces with poorly defined borders. The mass showed fat attenuation with numerous thickened septae. There were no calcifications within the mass. Due to her worsening airway symptoms the patient was taken to the operating room and a tracheostomy and transcervical approach to this left neck mass was performed. The mass was noted to have a fatty consistency consistent with lipoma but more posteriorly and inferiorly had a solid component adherent to the esophageal muscular layer. This was resected without violation of the mucosa and the mass was delivered from the mediastinum without a sternotomy. Pathology revealed a 197-gm, 15 x 5.5 x 4 cm mass surrounded by fibrovascular capsule. The gross appearance was non-uniform, with one large gray-yellow 5cm nodule. Microscopic evaluation exposed a well-differentiated liposarcoma with de-differentiated component. The majority of the specimen consisted of relatively normal appearing adipose tissue with scattered enlarged, irregular, hyperchromatic nuclei. There was a smaller component that showed an abrupt transition with highly pleomorphic cells in a fibrous background, including many cells having giant bizarre hyperchromatic and irregular nuclei with some being multinucleated. There was microscopic involvement of surgical margins at the left lateral esophagus as well as left lateral sternocleidomastoid muscle. The postoperative course was uneventful and the tracheostomy was decannulated and the patient started on peroral diet without incident. She was discharged home on postoperative day six. A postoperative CT showed no further evidence of tumor in the neck or mediastinum. Her case was reviewed at an interdepartmental sarcoma tumor board. Factors considered included the lack of residual gross disease and the morbidity of further resection, which would include laryngectomy and esophagectomy. The decision was therefore made to proceed with a combination of chemotherapy and radiation therapy for further management. After 4.5 years follow-up the patient is recurrence free.

**DISCUSSION:**

The retropharyngeal space is a potential space limited by the pharynx anteriorly and the prevertebral fascia posteriorly. The superior limit is the base of the skull and inferiorly, the fascial compartment ends within the superior mediastinum. The midline is divided by tough median raphe. Lymph nodes suspended within loose areolar tissue form the principal component. In their review, Yonus et al. compiled an exhaustive differential diagnosis of a retropharyngeal mass (Table 1).³ Retropharyngeal lipomas are relatively rare. In 1940 Putney and Fry reviewed 15 cases presented in the literature from 1877 to 1934.⁴

Subsequently 12 additional cases were analyzed and further compiled by Yoshihara et al in 1998. Patient ages ranged from 3 months to 71 years, with a male to female ratio of 1:3.1:1. Various lipomatous subtypes such as infiltrative and ossifying have also been described with similar clinical presentations.⁵⁻⁷ Retropharyngeal lipomas can grow to a considerable size before becoming symptomatic. The largest lipoma in Yoshihara’s series was 17cm x 11cm on one side and 11cm x 8cm on the other. These masses can also be found as an asymptomatic incidental finding.⁸ Common presenting symptoms include dysphagia, globus sensation, sleep apnea, and dysphagia related to upper airway obstruction.⁹⁻¹⁰ Lipomas typically arise from the subcutaneous tissue and rarely from deep soft tissue. Histologically they are composed of mature adipocytes without atypia and are often surrounded by a thin fibrous capsule. Lipomas can be diagnosed radiologically and findings on CT have been characterized as well-circumscribed masses with low attenuation related to fatty tissue (-50 to -150 Hounsfield units).⁶ Therefore, given the benign nature, surgical excision is targeted at alleviating symptoms and/or obtaining the definitive diagnosis. However, for patients either not consenting to undergo surgery or unable to undergo surgery due to significant comorbidities, these cases can be successfully managed with expectant observation and serial imaging.⁶,¹⁰ The natural course of retropharyngeal lipoma is therefore protracted without additional sequelae.

Liposarcoma is the malignant counterpart of a lipoma and most frequently arises in the deep soft tissue of the retroperitoneum and proximal extremities. The most recent World Health Organization classification of soft tissue tumors recognizes five categories of liposarcomas: well-differentiated, myxoid, round cell, pleomorphic, and dedifferentiated. Prognosis is correlated to the histologic subtype. Complete excision of well-differentiated and myxoid subtypes is considered curative with excellent 5-year survivals. Round cell and dedifferentiated subtypes have a high propensity for metastasis and 5-year survivals have been reported around 50%.¹¹ Liposarcomas of the head and neck are rare, thus retropharyngeal liposarcomas are rarer. Most recently, Ozawa et al. reviewed all 8 prior reports of retropharyngeal liposarcomas. The youngest patient was 39 at the time of surgery. Well-differentiated subtype was the most common followed by myxoid type. All of the malignancies were excised with a cervical approach except for Ozawa’s own patient, who underwent a transoral approach and resection. Follow-up for longer than 18 months has not been reported.²

**Table 1. Differential diagnosis of a retropharyngeal mass.**

<table>
<thead>
<tr>
<th>Developmental</th>
<th>Angiomatus Lymphoid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hamartoma</td>
</tr>
<tr>
<td>Traumatic</td>
<td>Chordoma</td>
</tr>
<tr>
<td></td>
<td>Foreign Body Abscess</td>
</tr>
<tr>
<td></td>
<td>Hematoma</td>
</tr>
<tr>
<td>Infectious</td>
<td>Acute/Chronic Abscess</td>
</tr>
<tr>
<td></td>
<td>Lymphadenitis</td>
</tr>
<tr>
<td>Neoplastic</td>
<td></td>
</tr>
<tr>
<td>Benign</td>
<td></td>
</tr>
<tr>
<td>Lipoma</td>
<td>Fibroma</td>
</tr>
<tr>
<td></td>
<td>Fibrolipoma</td>
</tr>
<tr>
<td></td>
<td>Osteoma</td>
</tr>
<tr>
<td></td>
<td>Osteochondroma</td>
</tr>
<tr>
<td>Malignant</td>
<td>Fibrosarcoma</td>
</tr>
<tr>
<td></td>
<td>Lymphoma</td>
</tr>
<tr>
<td></td>
<td>Liposarcoma</td>
</tr>
<tr>
<td></td>
<td>Leiomyosarcoma</td>
</tr>
<tr>
<td></td>
<td>Metastatic Carcinoma</td>
</tr>
</tbody>
</table>

---

© Society of Otorhinolaryngologists of Nepal (SOL Nepal)  
Vol. 2 No. 1 Issue 1 (Jan-Jun 2011)  
Nepalese Journal of ENT Head & Neck Surgery
A suspicion for liposarcoma is based on imaging studies. When evaluating a soft tissue mass with significant fat attenuation, it is crucial to hone in on suspicious radiographic findings. Kransdorf et al. compared both CT and MR images in order to distinguish between lipomas and well-differentiated liposarcomas. Thin septa were seen in both and were not significantly different. Through multiple logistic regression, only thick septa retained statistical significance for predicting liposarcoma. Calcifications were three times more common in liposarcomas than lipomas. However, 31% of lipoma images reviewed showed marked nonadipose areas, mainly correlating with fat necrosis, calcifications, and fibrosis with myxoid change. More specifically, many classically described liposarcoma findings can be also commonly found on lipoma imaging.12 Galant et al. reviewed MR sequences of lipomas versus well-differentiated liposarcomas. The liposarcomas showed gross features resembling ordinary lipomas. 23% of lipomas contained non-characteristic findings such as thick septa, nodules, and heterogeneous hyperintensities. However, in well-differentiated liposarcomas, all but one case had findings of thick septa, nodules, or both. However, employing fat-saturated-T2 weighted STIR sequence imaging, hyperintensities are reported to have a 100% and 82% sensitivity and specificity respectively.13 Suzuki et al showed the MRI presence of septa was significantly different between lipomas and liposarcomas. However, septa were still present in 10% of the lipomas. They also found no significant imaging diagnostic characteristics with the use of CT. Interestingly, FDG-PET could be used to quantify the metabolic activity of lipomatous lesions and can be useful in distinguishing between sarcomatous subtypes. However, the diagnostic accuracy with proposed Standardized Uptake Value (SUV) cutoffs are not dependable as of yet.14 The clinical presentation our lipomatous masses of the retropharyngeal space did not reveal any significant differences. Notably however, the benign lipoma showed upper aerodigestive symptoms in a more rapid progression than its malignant counterpart. The severity of dyspnea and dysphagia has only been reported in a few retropharyngeal lipomas. 1 Both of our patients required tracheostomy prior to resection; however both patients were successfully decannulated in short order after the surgery. The comparison of the radiologic features between the benign and malignant masses is striking. Although the lipoma did show septae within the bulk of the mass, they were thin and fine than the septae of the liposarcoma. The septae of the liposarcoma were more numerous, thicker, and overwhelmingly abundant as displayed clearly within the coronal sections. Classically, sarcomatous calcifications were found in proximity to the lipoma and yet were absent from the liposarcoma imaging. The most telling radiographic finding was fascial plane dissection. Whereas the lipoma’s bulk behaved as a singular bulk, displacing the normal fascial boundaries outwards; the liposarcoma’s bulk seemed to dissect within tissue planes along the path of the retropharyngeal space. There was considerable mass effect in both CT scans, yet it was the liposarcoma which displayed a marked diffusely spreading growth pattern. It is this last characteristic that distinguishes the liposarcoma imaging from our benign case. It is also worth noting however, that histologically benign infiltrative lipomas can also display this investing appearance.15 While three of the eight previously reported retropharyngeal liposarcomas required re-resection, the residual microscopic disease in our series responded well to postoperative chemoradiation.2 The patient is four years post-treatment without evidence of residual disease, without the need for re-resection. Consistent with the literature of retropharyngeal lipomas, our report also notes resolution of presenting symptoms after excision. This patient is free of recurrence and doing well.

CONCLUSION:
Illustrative cases of lipogenic masses of the retropharyngeal space have been presented: a lipoma and a liposarcoma. Both patients presented with severe airway symptoms and both required surgical airway for respiratory distress. Both were imaged with CT scans, with the liposarcoma showing two potentially diagnostic features: thick septae and a growth pattern showing dissection through fascial planes. Transcervical approach was adequate for resection of both lesions. Postoperative chemoradiation was required for the liposarcoma due to positive microscopic margins. Both patients have been followed for over four years post-operatively without evidence of recurrent disease. In the evaluation of retropharyngeal lipogenic masses, it is valuable to identify radiologic subtleties that distinguish lipomas from liposarcomas for proper surgical planning and appropriate treatment.

REFERENCES:
OSTEOMA TEMPORAL BONE – RARE CASE

A woman of 25 years presented to E.N.T OPD with complaints of post aural swelling of 3 years of duration. Patients had no other complaints except a mass behind post aural region. Examination revealed 4x3 cm solitary, non pedunculated, nontender, hard mass behind the right ear. Under general anaesthesia the mass was exposed adequately and with cutting burr the bony mass was excised and sent for HP examination. Wound was closed in Layers and pressure bandage applied. Histopathology was reported as osteoid osteoma. This is one of the rare cases and reported for its important clinical significance.

Key words: osteoma, mastoid

INTRODUCTION:
Osteomas are rare benign slow growing tumors of the lamellar bones. They are commonly seen arising from within the paranasal sinuses. Osteoma of the temporal bone occurs infrequently and when they occur is seen most commonly in the external ear canal. Osteoma originating from the middle ear is very rare. Those from the mastoid are rarer.

CASE REPORT:
A 25 years old woman presented with slowly increasing swelling behind the left ear of three years duration. She had no history of trauma, ear infection and swelling caused no pain, ear ache, aural discharge, and vertigo or hearing loss. On examination the post aural swelling was 4x3 cm in size, non tender, hard and had well defined margins, overlying skin was free and showed no signs of inflammation. Rest of the E.N.T examination, audiometric testing and routine laboratory investigations produced normal results and there were no other remarkable features on general physical examination. X-ray mastoid lateral oblique view showed radio dense shadow in right temporal bone (Fig-1).

She was taken up for excision of the osteoma under general anaesthesia. A modified postaural incision was given sufficiently behind the groove to expose the tumor completely (Fig-2).

After sequential dissection the osteoma was freed of all muscle attachments. A mastoid drill using cutting burr was used to excise the tumor. Finally the edges of the bone were polished with the round burr and the incision was closed in layers. She had an uneventful postoperative period. Histopathology confirmed an osteoid osteoma. She is being followed up in E.N.T OPD regularly.

DISCUSSION:
Osteoma is a slow growing tumor formed by mature bone tissue. Stuart defined Osteoma as benign circumscribed slow growing tumor of the mastoid Bone.1 Osteomas are commonly seen in the frontoethmoidal region. The most common sites of the osteomas are frontal sinus followed by ethmoid and maxillary sinuses. They are rare in the sphenoid sinus and extremely rare on temporal and occipital
squam.2 Exostoses of the external auditory canal and mastoid have also been reported. It has higher incidence in female patients, predominantly in 2nd and 3rd decades of life and is rare in puberty.3,4 Most often they are localized on the sutures, except for cortical lesions that are seen initially as cosmetic deformities. The main clinical symptom is headache of varying intensity and quality, and in most cases is not proportionate to the size of osteoma which ranges from the size of pepper to the size of child’s head. Tumors involving the middle and inner ear are most frequently small and tend to remain stable in size. Consequently they are managed expectantly. Surgery is indicated in the cases of deafness, discharge, dizziness and headache.5 Giant occipital osteomas can cause dizziness requiring surgical excision.6 Temporal Osteomas have been found to produce intracranial complications justifying surgical removal. It may produce external deformity and push the pinna forward.7 Even though it is normally asymptomatic it may produce pain by invasion of neighboring structures or widening of periosteum. If located in external auditory canal it may lead to occlusion progressing to chronic otitis externa (30% of the cases) and conductive hearing loss.8,9 In present case the patient did not have any complaints and swelling was removed because of cosmetic reasons. Excision is not mandatory but if performed the surgery should include careful removal of periosteal cover and safe margin of mastoid cortex around it.3 If tumor is close to significant structures such as bony labyrinth and facial nerve canal a sub total excision ensures preservation of function. We should be very careful when providing intervention of tumor close to sigmoid sinus, because they can progress with significant bleeding, meningitis, thrombophlebitis.8,9 Surgical complications include recurrence, facial nerve palsy, sigmoid sinus damage and sensorineural Hearing loss.4,8

Three types of mastoid Osteoms have been described based on structural characteristics.7-9

- Compact: the most frequent one, comprising dense, compact and lamellar bone with few vessels and haversian canal system.
- Cartilaginous: comprising bone and cartilaginous elements
- Spongy: rare type
- Mixed: mixture of spongy and compact type.10

The cause of Osteoma has still not been defined according to congenital theory. Presence of embryonic cartilage results in intensified bone growth after puberty. Most authors feel that it originates from preossseous connective tissue.4,7,8,10

Treatment is indicated for osteomas that are symptomatic or cosmetically unacceptable. Drilling superficial lesion of the mastoid and squama is a simple procedure, these lesions are limited to the external cortex so a cleavage plane, where the tumor meets normal bone is readily encountered. In mastoid osteomas involving the facial canal or bony labyrinth complete removal of the lesion is not recommended because damage to the structures is likely.9 Tumors involving the middle and inner ear are usually small and tend to remain small, so observation is preferred when symptoms are absent. When there is functional disorder such as hearing loss or vertigo judicious removal of the tumor can be undertaken.9 Surgical management of internal auditory canal osteomas has varied. Both middle cranial fossa and sub occipital approaches have been employed. The approach used depends, on the location and size of the lesion and preference and experience of the surgeon.10

CONCLUSION:
Osteoid osteoma of the temporal bone is an infrequent benign bone tumor. The suspected diagnosis is based on clinical findings (occasionally pain, cosmetic deformities, repeated external otitis and conductive hearing loss), otoscopy, and computerized tomography.

REFERENCES:
SPINDLE CELL RHABDOMYOSARCOMA OF THE TONGUE – A RARE ENTITY

Spindle cell variant of Rhabdomyosarcoma is a rare malignant tumor in adults but even more so in tongue. We report a case of a 17 years old boy who presented with a polyoidal swelling on the tip of the tongue. The mass was excised and the specimen was sent for histopathological evaluation which showed a malignant spindle cell tumor. On the basis of morphological features and immunohistochemistry findings a final diagnosis of rhabdomyosarcoma, Spindle cell variant was made.

Key words: desmin, rhabdomyosarcoma, tongue

INTRODUCTION:
Rhabdomyosarcoma (RMS) comprises a group of soft tissue neoplasms that shares the propensity to undergo myogenisis.¹ There is a bimodal distribution of presentation with an initial peak incidence between 2-5 years of age and a second surge at 10-19 years.² This results in its resemblance with different stages of skeletal muscle development during prenatal life. The annual incidence of RMS is about 8 in a million children.² RMS is the most common sarcoma in infants and children and represents 5-15% of all the solid neoplasms.² Most common head and neck site include the orbit, nasopharynx, paranasal sinuses, cheek, neck, middle ear and larynx. The occurrence of RMS in the tongue is uncommon.² The spindle cell variant of rhabdomyosarcoma (RMS) is a commonly encountered tumor in the paratesticular region of children.¹ Other sites if involved includes the oral cavity, parotid gland, nasopharynx and nasal cavity. Less than 10 % of adult rhabdomyosarcomas are spindle cell variant.⁴,⁶ Histologically they show proliferation of spindle shaped cells with pale cytoplasm arranged in interfacing fascicles.⁵ Individual cells have small nuclei and inconspicuous nucleoli. Scattered rhabdomyoblasts are seen. Only few case of spindle cell RMS of tongue have been reported in literature.⁵,⁶

CASE REPORT:
We report a case of a 17 years old male who presented with a swelling on the tip of his tongue. The swelling had developed over a period of 8 months. The clinical impression was of Myoepithelioma. The lesion was surgically excised and the specimen was sent to the Histopathology Department for histological evaluation. On gross examination the specimen consisted of a yellow white nodular piece of tissue measuring 7 x 5 x 3 cm. On serial slicing the tumor had whorled appearance. Multiple sections of the tumor were taken and then examined. Microscopic picture revealed a tumor composed of fascicles of atypical pleomorphic spindle shaped cells. The cells were arranged in fascicles and focal storiform arrangement. Many typical rhabdomyoblasts having hyperchromatic eccentric nuclei and abundant eosinophilic cytoplasm were seen. The tumor cells were separated by fibrous stroma. Areas of tumor necrosis were also seen. The tumor had infiltrating borders and was involving the circumferential resection margin and invading the muscles. Immunohistochemical markers were applied. Desmin, Myogenin and MyoD1 were positive. Vimentin showed focal positivity. S-100, GFAP and CK AE1/AE3 were found to be negative. The morphological features and immunohistochemistry results favoured the diagnosis of rhabdomyosarcoma, spindle cell variant.

DISCUSSION:
Spindle cell RMS is a variant of embryonal RMS composed of elongated spindle cells and associated with a good prognosis.⁷ Spindle cell variant is relatively newer entry, first described in 1992.⁷ It is uncommon and usually found in the paratesticular region in children.³ It is an unusual finding in adults and the tongue is a rare site.⁴ Clinically these tumors may present as bulging, infiltrative, growing soft tissue masses which may be fungating exhibiting pressure effects with difficulty in speech and swallowing.² On gross examination of the resected specimens, the tumor has firm tan yellow color and whorled cut surface resembling leiomyoma. Histologically, the tumor cells present with shapes of different developmental stages of myogenesis.¹ Key cell to recognize by routine microscopy is the rhabdomyoblast, a cell with an eccentric round nucleus and variable amounts of brightly eosinophilic cytoplasm. Less than 30% of cases may show skeletal striations.² The mitotic count is usually low. RMS spindle cell variant being composed of elongate spindle cells arrayed in tight fascicles with variable amounts of intervening collagen. A group of these lesions were consequently described by Cavazanna et al., who confirmed their superior prognosis and found that the majority occurred in the paratesticular region. Spindle cell rhabdomyosarcomas may arise in adults, in whom they may have a worse prognosis. According to the series by Nascimento and Fletcher, they most commonly arose in the head and neck rather than paratesticular soft tissue. In the setting of adult neoplasia, they can pose a diagnostic dilemma because of their resemblance to smooth muscle tumors and other spindle cell lesions. This challenge can be solved by Immunohistochemistry and/or electron microscopic studies. Thus, immunohistochemistry is used extensively to distinguish RMS from its mimics.¹ Myogenin and MyoD1, myogenic transcriptional regulatory proteins expressed early in skeletal muscle differentiation, are considered sensitive and specific markers for RMS and are more specific than desmin and muscle-specific actin and more sensitive than myoglobin. Because the extent of myogenin expression in RMS is much greater than in non-RMS, it is a very useful marker when interpreted in the context of other clinicopathologic data. In our case the clinicopathological picture as well as the Immunohistochemical results corresponds to the ultimate diagnosis of spindle cell variant of Rhabdomyosarcoma of the tongue.
CONCLUSION: Spindle cell variant of Rhabdomyosarcoma is a rare tumor of the tongue. It poses a diagnostic challenge due to its histological similarity with other smooth muscle cell neoplasms.

REFERENCES:
LEIOMYOSARCOMA OF THE NASAL CAVITY

Leiomyosarcoma of nose and paranasal sinuses is very rare. In this case report, 48 years old lady with a huge nasal mass protruding from left nasal cavity has been presented. Clinical presentation, pathology and treatment are discussed.

**Key words:** leiomyosarcoma, nose and paranasal sinuses.

**INTRODUCTION:**
Leiomyosarcoma is a malignant neoplasm arising from smooth muscle. Smooth muscle is present everywhere in our body. However, leiomyosarcoma accounts approximately only 7% of all soft tissue sarcomas and occurs most frequently in the gastrointestinal tract and uterus. Only 3% of them arise in the head and neck. Leiomyosarcoma of nose and paranasal sinuses is very rare. When they occur in the sinonasal tract, the most common sites are the nasal cavity, the maxillary sinus, and the ethmoid sinus, in decreasing order. A case of this kind of malignancy of the nasal cavity who presented with a huge nasal mass protruding from left nasal cavity has been presented. Clinical presentation, pathology and treatment are discussed. This is the first case of leiomyosarcoma of nasal cavity reported in our country so far.

**CASE REPORT:**
A 48 year old farmer lady from Midwestern part of Nepal presented to the ENT OPD of Tribhuvan University Teaching Hospital, Maharajgunj, Nepal with complaints of left sided progressive nasal obstruction, nasal mass in the left nasal cavity and blood tinged nasal discharge for last 2 months. On examination, there was a reddish black mass protruding from the left nasal cavity with obliteration of the left nasolabial fold (fig.1). There was gross DNS on the right side and on posterior rhinoscopy bilateral choanae were free. There was no palpable neck node. Contrast enhanced CT scan showed mildly enhancing soft tissue density expansile mass lesion with areas of necrosis and early bony erosion in the left nasal cavity (fig.2).

Three months prior to presentation in our hospital she had undergone excision of the nasal mass in a Zonal hospital. She had history of progressive nasal obstruction on the left side and minimal nasal bleeding for 1 year. The histopathological examination (HPE) reported squamous cell papilloma. For about 1 month she was symptom free but for last 2 months her nasal symptoms increased rapidly. She underwent wide excision of the nasal mass via lateral rhinotomy approach in our hospital. The mass was attached to the left nasal vestibule, inferior and middle turbinates and adjacent part of septum. The HPE of this mass revealed intersecting fascicles of spindle shaped cells showing moderate degree of pleomorphism and containing scanty to moderate amount of cytoplasm with cigar shaped to atypical lobulated nuclei and abundant mitosis and multiple areas of necrosis, consistent with leiomyosarcoma (fig. 3).

**DISCUSSION:**
As mentioned earlier leiomyosarcoma of nose and paranasal sinuses is very rare. The first case of leiomyosarcoma of nasal cavity and paranasal sinuses was reported in 1958.3 Leiomyosarcomas of the sinonasal tract are more common in men than in women.4 The average age at diagnosis is 50 years.5 Initial symptoms in order of decreasing frequency include nasal obstruction, epistaxis, facial pain, and facial swelling. Sinonasal tract leiomyosarcoma is characterized as rapidly spreading and locally aggressive but rare regional lymph node involvement and metastatic potential. However, there are some reports of sinonasal leiomyosarcoma with cervical node metastasis.6,7 Our patient presented with progressive nasal obstruction, nasal mass in the left nasal cavity and blood tinged nasal discharge for last 2 months. She had no palpable neck node. On histological examination, the tumor is made up of intersecting fascicles of spindle-shaped cells that have elongated, blunt-ended nuclei and eosinophilic cytoplasm. Numerous mitotic figures are present. The
cytoplasm of the tumor cells stains red in Masson's trichrome medium. Our patient's postoperative histopathological report was more or less similar to this picture. Immunohistochemical test should be done to differentiate this tumor from other spindle cell tumors but test is not available in our setting. On CT Scan, leiomyosarcomas appear as bulky masses, and they are frequently associated with extensive destruction of bone. Contrast enhanced CT Scan of our patient showed mildly enhancing soft tissue density expansile mass lesion with areas of necrosis and early bony erosion in the left nasal cavity. Wide excision is the treatment of choice. Regular follow up is necessary due to its high rate of recurrence. However, in some centers surgical excision has been combined with radiotherapy and chemotherapy. Our patient underwent wide excision of the tumour and on the basis of HPE postoperative chemoradiation was planned but missed the follow up though regular follow up is also mandatory.

Acknowledgement
We would like to thank Dr. Anjan Shrestha, lecturer, Dept. of Pathology, TUTH, Maharajgunj for providing microphotographs.

REFERENCES:
1. Lippert BM, Godbersen GS, Lüttges J, Werner JA. Leiomyosarcoma of the nasal cavity. Case report and literature review. ORL J
OUTCOMES OF PAEDIATRIC ENT APPOINTMENT FOR SURGERY

Objective:
The study aimed to determine the average waiting period for elective surgery and turn-up rate in paediatric otorhinolaryngology in the Department of GMS Memorial Academy for ENT and Head & Neck Studies, Tribhuvan University Teaching Hospital.

Material and methods:
Paediatric ENT appointment register for elective surgery and paediatric ENT surgery register were analyzed from 8th February 2009 to 9th February 2010 to see for the average waiting period for surgery, the turn up rate, reasons for non-attendance, postpone and cancellations.

Results:
A total number of 417 children had their data in the appointment register for elective surgery. Out of them, 322 children were given dates for elective surgery and 95 children were called for chance basis. Fifty-one percentage 195 of children who were dated for elective surgery had an average waiting period of 5-6 months, 182 patients didn’t turn up for the surgery, 30 patients were postponed by prior information, two surgeries were cancelled at the time of operation and eight surgeries were not performed due to other reasons. Out of the 220 patients that underwent surgery, only 68 (31%) patients were dated while the rest were either on chance basis or adjusted due to urgency for surgery due to various regions. The most common surgery performed in the children who were dated was unilateral myringoplasty where as adenotonsillectomy was the most common surgery in the children who were operated on chance basis.

Conclusion:
The average waiting period for elective surgery in paediatric otorhinolaryngology is quite long and the turn up rates in the elective surgery is also not high. To reduce both the parameters and to provide better services to the patients, a pre-admission assessment clinic prior to surgery and provision of an urgency categorization of the disease might be helpful.

Key words: paediatric patient, waiting period, elective surgery.

INTRODUCTION:
It is estimated that 25,000 patients visit to the Department of ENT & Head and Neck Surgery (ENT-HNS) of Tribhuvan University Teaching Hospital every year and among them 1600 (6.5%) patients undergo surgery. Among these patients nearly 15% are the paediatric patients. In the year 2010, 3668 children visited the department of ENT-HNS and out of which 250 children underwent elective surgery. It is increasing challenge for us to manage the increasing list of patients who are planned for paediatric surgeries.

In a study of Coir,1 it was mentioned that 15% of 731 patients had been waiting for three years for their surgery and over 350 hours of theatre time and over 3,200 in-patient bed days would be required to clear this waiting list. However, in contrary to the long waiting list, it was seen that there was significant incidence of non-attenders (drop out) in the age group of less than 16 years as in the study of Hampil and Flood.2 Non-attendance leads to wastage of valuable theatre time and prolongs the already lengthy waiting list times for the rest of the patients. Saskatchewan Surgical Patient Registry of Saskatchewan, America showed that in the paediatric age group, there were various waiting periods for different types of surgeries, such as maximum number of patients waited for 3-6 weeks for myringotomy, 7-12 weeks for nasoseptal reconstruction and 4-12 months for tonsillectomy with or without adenoidectomy.3

To reduce the burden of the waiting list in the paediatric age group, many countries have devised priority classification level for different surgical illnesses that would have to undergo surgery in the specified defined period of time. However, we do not have such guidelines in Nepal. It is an increasing challenge for hospitals to maintain a focus on rising demand for elective surgery in Paediatric ENT. The objectives of our study were to determine average waiting period for elective surgery in paediatric ENT patients, and their turn up rate in paediatric otorhinolaryngology.

Material and methods:
It was a retrospective study carried out from 8th February 2009 to 9th February 2010 in the unit of Paediatric Otorhinolaryngology in GMS Memorial Academy for ENT & Head and Neck Surgery, TU Teaching Hospital. Paediatric ENT appointment register for surgery was analyzed for the duration of waiting period, number of patients who were dated for surgery, number of patients turning up for surgery on the given date and also the number of patients who were called on chance basis i.e. if electrolytically called patients didn’t turn up then the patients called on chance basis would get the opportunity to be operated, so the operating theatre time didn’t go waste. Paediatric ENT surgery register was also analyzed to see the total number of surgeries performed, to see the number of dated patients that underwent surgery, to see the number of chance basis patients that underwent surgery and to see the number of patients that underwent surgery but were not noted in the pediatric ENT appointment register.

Results:
We have one day in a week set for surgery for paediatrics ENT. Out of the 52 OT days in the year, we had only 48 days of OT days due to public holidays and OT cleaning day. Two hundred twenty cases had undergone various surgeries during the period. So, on an average there were 4.5 cases per day. In the period of one year, 417 patients were given dates for surgery, out of which, 322 patients were dated while 95 patients were called for chance basis. It was seen that 51% (195 patients) of the dated patients had waiting period of 5-6 months and the maximum waiting period was 9 months.

Fig: 1. Distribution of patients according to waiting duration

Out of the 220 patients that underwent surgery, 68 (31%) patients were dated while the rest were either on chance basis or either not mentioned in the appointment register. Out of the 417 patients dated for surgery, 182 patients didn’t turn up for the surgery, 30 patients...
were postponed, two surgeries were canceled and 8 surgeries were not performed due to other reasons. Out of 182 patients who didn’t turn up for surgery, randomly 20 patients were telephoned and asked why they were unable to come on the contact date and the reasons are given in the table 1. Guardians of seven children informed us that they had been operated elsewhere as they thought that waiting period was too long. Thirty surgeries were postponed and the most common cause for postponing was active infection of the ear and viral illness. Two cases were canceled, one was due to time constraint and the other was due to anaesthetic complication during induction of anaesthesia.

Table: 1. Causes for not appearing on the contact date for surgery

<table>
<thead>
<tr>
<th>Causes</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operated elsewhere</td>
<td>7</td>
</tr>
<tr>
<td>Pre-poned</td>
<td>3</td>
</tr>
<tr>
<td>Late for appointment</td>
<td>2</td>
</tr>
<tr>
<td>Patient not well</td>
<td>5</td>
</tr>
<tr>
<td>Financial reason</td>
<td>1</td>
</tr>
<tr>
<td>Improving</td>
<td>1</td>
</tr>
<tr>
<td>Lost papers</td>
<td>1</td>
</tr>
</tbody>
</table>

The common surgery performed in the children who were dated was unilateral myringoplasty and adenotonsillectomy was the most common surgery in the children who were operated on chance basis.

DISCUSSION:
In our study, only 31% of the children who were given appointment for surgery underwent surgery on the given date. One hundred eighty two children didn’t turn up for surgery, whereas 30 patients were postponed, two surgeries were canceled and 8 surgeries were not performed due to other reasons. Hampal and Flood found that 14.6% of operations were canceled due to non-attendance of the patient. It has also been reported that the commonest cause of patient self cancellation is upper respiratory tract infection, which is commoner in winter and is considered to be a contraindication for ENT surgery. In our study, the common cause of cancellation was due to active infection in the chronic otitis media, mucosal type followed by viral fever. Those patients on longer waiting lists were less likely to attend than those on shorter waiting lists. In contrast, those patients with serious diseases such as cholestomatoma were less likely to default than those with relatively more trivial disease such as those listed for septal surgery. The underlying reason may partly be due to the severity of the symptoms experienced by the patient, and partly to the nature of the advice offered by the medical officer regarding complications resulting from delay of the treatment. So, categorization of the disease into grades of severity and giving dates accordingly might be helpful to relieve the symptoms in a child with more severe disease and also to allay the anxiety of the parents.

The advantages of the pre-admission clinic have been discussed at length in other studies. Pre-admission clinic at our setup might be helpful for recognizing the patients who might get canceled due to infections or patients who won’t be turning up for surgeries because they have been operated somewhere else, so that we can adjust other children who are in the waiting list. In a study of Woolford, nineteen (27%) of the 70 children who completed the study were in the waiting list no longer warranted surgery and were removed from the waiting list and they concluded that those children who had been on the waiting list for a long period of time should be reassessed prior to the planned tonsillectomy to see if surgery is still indicated.

As we also call children for surgery on chance basis that is when the parents think that the waiting period is long they can come sooner but will get a chance for the surgery only if the elective patients do not turn up for the surgery. This system has been helpful to us as the theatre time does not go in waste, if the elective patients do not turn up. However, the surgery appointment register could be filled in more detail regarding the patients on chance basis, causes of postponing, cancellations, not turning up and if operated on earlier date which would be helpful for better and further studies.

Finally the recommendations of this audit are: 1. Surgery appointment book to be filled in detail and correctly. 2. Urgency Categorization of the disease. 3. Pre-admission assessment Clinic.

CONCLUSION:
As a tertiary centre of the country there is much load in the elective surgery list in the Paediatric Otorhinolaryngology unit of TU Teaching Hospital. The waiting period is quite long and the turnover is not as expected. There are many factors which may be responsible and some modifications such as urgency categorization of the disease and pre-admission assessment clinic might be helpful to achieve a better service to the patients.

REFERENCES:
RECURRENT RESPIRATORY PAPILLOMATOSIS

Objective of this article was to review the current knowledge regarding the etiology, clinical presentation and therapeutic procedure available for recurrent respiratory papillomatosis (RRP). Representative articles were searched, selected and reviewed. Human papilloma virus type 6 and 11 accounts for majority of cases of RRP. Hoarseness, stridor, chronic cough, dyspnoea are common presenting clinical presentation of RRP. Surgery is the treatment of choice and use of CO2 laser has been the mainstay of treatment modality. Recently photodynamic therapy, adjuvant therapy like antiviral therapy, immunotherapy and Human papilloma virus vaccines has shown efficacy in treatment of RRP.

Key words: recurrence, respiratory papillomatosis, human papilloma virus.

INTRODUCTION:
Recurrent Respiratory Papillomatosis (RRP) is a disease of viral etiology characterized by recurrent proliferations of benign squamous papillomas anywhere in respiratory tract from nasal vestibule to the terminal bronchi. Predominant site being vocal folds, tonsillar pillar, uvula where there is change of epithelium.1 Although they can be found anywhere in the aerodigestive tract, there appears to be a predilection for areas where there is a junction of squamous and ciliary epithelium. This includes the limen vestibuli (junction of the nasal vestibule and the nasal cavity proper), nasopharyngeal surface of the soft palate, mid-zone of the laryngeal surface of the epiglottis, upper and lower margins of the ventricle, undersurface of the vocal folds, carina and bronchial spurs.2 Interestingly, virus can be detected in the normal mucosa adjacent to lesions. It is thought that this provides a reservoir for regeneration of new papillomata. The disease has bimodal age distribution. Juvenile onset peaks around three to four years of age and adult onset peaks around 20-30 years of age. The natural history of recurrent respiratory papillomatosis is highly variable. Clinical presentation is usually with hoarseness or with symptoms of airway obstruction. After presentation, the disease may undergo spontaneous remission or persist in a stable state, requiring only periodic endoscopies. It also may take a progressive form, with distal spread down the tracheobronchial tree. Remissions and exacerbations of RRP are extremely common in both juvenile and adult onset disease and are unpredictable. Recurrent disease has been reported to develop after as long as 31 years of complete remission. Despite much speculation in the past that remissions and even permanent regression of respiratory papillomatosis often correlate with puberty, this does not in fact appear to be the case. On the other hand, pregnancy is associated with accelerated papilloma growth and reactivation of latent disease.

AETIOLOGY:
Ullmann in 1923 was the first to verify an infectious etiology by injecting homogenized papillomata from a child’s larynx into his own forearm and observing the development of papillomata there.1 RRP was confirmed to contain human papillomavirus (HPV) DNA in 1980 by Quick et al.9,10 The human papillomavirus is a naked, double-stranded, icosahedrally-shaped virus with circular supercoiled DNA that belongs to the Papovavirus family. There are 90 subtypes of HPV known2, but only a few commonly cause RRP. The subtypes which usually cause RRP 6 and 11, although other types have been found. HPV types 6 and 11 account for the majority of cases of RRP, with HPV 11 occurring most commonly (52–62%) and running the most aggressive clinical course, followed by HPV 6 (24–48%).11-13 HPV types 16, 18, 31 and 33 have been rarely reported in RRP.14 Malignant transformation in RRP has generally been reported in adults with other risk factors such as tobacco use or exposure to radiation, but is also found in children, occurring in 16% of those with lung involvement.15,16 Transmission of RRP has classically followed different routes for Juvenile onset RRP and Adult onset RRP. In juvenile cases vertical transmission is thought to occur, with first-born children of lower socioeconomic status and teenage women with active genital HPV infections at greatest risk. Adult onset RRP, transmission occurs in patients with multiple oral sex partners. Caesarean delivery does not prevent every case of infection and is not routinely recommended with active HPV infection.17,18

CLINICAL PRESENTATION AND DIAGNOSIS:
Juvenile onset RRP commonly presents between two to four years of age with hoarseness, which may progress to stridor, increased work of breathing and eventually, complete airway obstruction. Less common presenting symptoms include chronic cough, recurrent pneumonia, dysphagia, failure to thrive, dyspnoea or acute life-threatening events. Adult onset RRP peaks between 20 and 40 years of age, with a slight male predominance and generally have more benign clinical course than JORRP.14,15 Patients should be assessed with a complete head and neck examination, including observation of general appearance and auscultation of the upper airway. Patients with signs of air hunger; including neck extension, leaning forward with forearm support of the upper body (the tripod position), nasal flaring, drooling, use of accessory muscles of respiration or cyanosis, may require expedientoperative intervention. Out patient evaluation will also include a flexible fibre optic examination of the upper airway. After application of a topical decongestant (with a topical anaesthetic in larger children or adults), the nasopharynx, oropharynx, hypopharynx, larynx and subglottis are sequentially evaluated. Care should be taken to closely examine the squamocolumnar junctions.
of the airway, i.e. the limen nasi, the soft palate, the ventricle and the undersurface of the true vocal folds, as these transition zones have been shown to have a predilection for RRP manifestation.\(^4\) 

Macroscopically, the papilloma can be pedunculated or sessile. Microscopically, the papilloma appears as exophytic lesion consist of multiple finger-like projections with a central fibrovascular core, which are typically covered by stratified squamous epithelium.

**TREATMENT:**
The main aim of treatment for RRP is the removal of papillomas and restoration of a normal airway at the same time minimizing trauma to the mucosa and vocal cords. The patients may require multiple surgical excision for restoration of airway and occasionally require tracheotomy. But tracheotomy is deferred as the there is a risk of distal spread of papilloma. The primary cause of papilloma extension to the lower airways appears to be iatrogenic, i.e. the tracheotomies performed in children with laryngeal papillomatosis (92.5% of cases). This was reported in a case group of 448 children with RRP treated in St. Vladimir Moscow Children’s Hospital between 1988 and 2003.\(^3\)

**SURGICAL TREATMENT:**
Powered microdebrider has become gold standard modality of treatment for RRP. This modality of treatment is better than other modalities as it allows gentle but comprehensive removal of papillomas with minimal contamination of the lower respiratory tract with blood or papilloma. There is no thermal injury and can be used in direct endoscopic control. Various clinical trials has shown that compared with CO2 laser, it has good disease clearance, shorter procedure & less postoperative pain. However long term results of these studies are still awaited.\(^4\) Cold Steel Surgery microsurgical excision was the earliest transoral management option for RRP and is still a preferred treatment in Adult onset RRP with limited involvement. Standard microlaryngeal instruments and techniques may be utilized to completely excise laryngeal papillomata with good voice results, and in one recent series complete remission was observed in two year follow-up of six primary AORRP patients, although this treatment is not as effective in recurrent or extensive disease.\(^4,20\)

**LASER EXCISION:**
CO2 laser has been the mainstay of treatment and treatment of choice for treatment of RRP. At the present time, the control of respiratory papillomatosis is best achieved with periodic microsuspension laryngoscopy and carbon dioxide laser vaporization. This method has proved superior to other endoscopic techniques such as cup-forceps removal, cryosurgery, and suction diathermy. The laser permits a more precise and complete removal of disease, while providing effective hemostasis. These factors help to minimize the chance of acute postoperative airway obstruction, which had discouraged regular eradication of papillomas prior to the introduction of the CO2 laser. Despite the improvement over other endoscopic modalities, laser vaporization is certainly not without its risks. Aside from the attendant risks of hypoxia and airway obstruction during any endoscopic procedure on these patients, complications such as airway fire, pneumothorax, laryngeal and tracheal stenosis, and tracheocutaneous fistula have all occurred with this therapy. Late soft tissue complications like vocal fold fibrosis and stenosis, glottis webbing and artenoid fixation has been reported in 35-45% cases.\(^6,7,8\) It is also important to mention that HPV 6 and 11 viral DNA have been detected in the laser plume, which theoretically may pose a risk to health care workers. Specialized masks are available to help filter out viral particles. Newer ultrapulsed laser models with a micromanipulator allow for beam-shaping capabilities to form a dot, line, circle or arc to further increase the precision of tissue ablation. Fibre delivery systems are also being developed for the CO2 laser (Omniguide\(^6\), Inc., Cambridge, Massachusetts), which has shown good cutting efficacy and healing characteristics in early studies.\(^21\) and may provide additional flexibility for ablating papilloma disease in difficult locations endoscopically. Angiolytic lasers including the 585nm pulsed-dye laser (PDL) and the 532nm pulsed potassium–titanium–phosphate (KTP) laser are popular emerging treatments for RRP. They are absorbed selectively by haemoglobin, causing selective tissue ablation in the highly vascular papilloma lesions, and allow serial office treatments in AORRP or co-operative older children. Early studies have shown favorable results both in efficacy of disease ablation and in preservation of underlying normal tissues and voice outcomes.\(^20,22,23\)

**PHOTODYNAMIC THERAPY:**
Photodynamic therapy is based on the principle that rapidly proliferating tissue selectively takes up a photosensitizing agents when administered intravenously. These agents release tumoricidal oxygen derivative by laser light of appropriate wavelength. The various randomized control trial using dhematoporphyrinether and meso-tetra chloride along with shows significant decrease in papilloma size.

**ADJUVANT THERAPY:**
Can be divided into antiviral therapy, immunotherapy, vaccines and gene therapy

**ANTIVIRAL THERAPY:**
Cidofovir is an acyclic nucleoside phosphonate. It causes inhibition of viral DNA polymerase essential for viral multiplication. Multiple case series have studied the efficacy of intralesional cidofovir, with 60% demonstrating favourable results and low numbers of nonresponders.\(^16,24,25\) In addition to a relative lack of studies with a high level of evidence, concerns have also been raised regarding the carcinogenic potential of cidofovir as mammary adenocarcinomas were shown to occur in rats exposed to cidofovir. For this reason the task force on RRP has recommended limiting usage of adjuvant cidofovir to dosages less than 5mg/kg and only to severe recalcitrant cases. Multiple other adjuvant therapies have been tried with some benefit, but limitations in data preclude significant clinical conclusions. These include indole 3-carbinol, retinoids, alpha-interferon and photodynamic therapy.\(^24\)

**IMMUNOTHERAPY:**
The quadrivalent HPV-recombinant vaccine is now in use for prevention of HPV infection, but is also under development to examine the therapeutic possibilities of this vaccine in RRP. Heat-shock protein E7 (HspE7) is the fusion protein of recombinant Hsp65 from Mycobacterium bovis and the E7 protein from HPV 16, although not currently commercially available, may have some clinical utility in the future.

**HUMAN PAPILLOMA VIRUS VACCINES:**
Work on an HPV vaccine began at multiple institutions in 1991. Currently, two vaccines have been developed and studied, but the quadrivalent HPV recombinant vaccine, which has shown efficacy against HPV 16 and 18 and HPV 6 and 11, has received US Food and Drug Administration (FDA) approval and recommendations by the Advisory Committee on Immunization Practices (ACIP) and the American Academy of Pediatrics (AAP) Infectious Disease Committee for implementation among school aged females.

**REFERENCES:**
**INTRODUCTION:**
In certain types of perforation of tympanic membrane (TM) graft uptake results of myringoplasty are poorer as compared to others. Total or subtotal and anterior perforations of TM, revision procedures, surgery in wet ears, patients with abnormal opposite ears, ears with extensive tympanosclerosis and paediatric age group are considered negative prognostic factors for tympanoplasty. In such high risk situations, cartilage in various shapes are increasingly being used for repair of TM defects1 with up to 100% uptake results. Cartilage as palisades for repair of TM are commonly being used for myringoplasty and in atelectatic and cholesteatomatous ears especially in children.6 Advantages of cartilage as graft are its low metabolic rate with nourishment by diffusion,5 its stability and resistance to negative pressure and infection in middle ear.5 Its vibration characteristics especially if thinned or used in the form of islands or palisades are close to normal TM with comparable hearing results.8,9 Palisade reconstruction of TM facilitates its mobility and decreases the acoustic impedance in comparison with larger pieces of cartilages.9

**PATIENT SELECTION AND PRE-OPERATIVE PREPARATION:**
Large perforations of TM with more than 50% defect in patients of 13 and more years of age were selected for myringoplasty. Oral ciprofloxacin 500 milligram 12 hourly was started one day prior to surgery which was continued till seventh day postoperatively. Patients were sedated by intramuscular injection of 50 milligrams of pethidine and 25 milligrams of phenergan or less depending upon the body weight of the patient about 30 to 45 minutes pre-operatively.

**SURGICAL PROCEDURE:**
Surgery was performed under local anaesthesia with about 5-10 ml of 2% xylocaine combined with 1:200,000 of adrenaline depending upon the approach selected. Four quadrant local injection was given in the canal and around tragus. About 2 cm vertical incision was given in the anterior wall of external auditory canal using a number 15 surgical blade starting from incisura terminalis down to upper aspect of inter-tragal notch about 3 mm medial to the tip of the tragus through the tragal cartilage in a single stroke. Either a skin hook or right angled retractor was used to retract the tissues anteriorly by one hand and a small suction tip on the other hand was used to clear the blood by the assistant. Surgeon using non-toothed forceps on one hand and fine graft scissors on the other first elevated the flap off the attachment from the canal side of the tragal cartilage keeping the perichondrium intact. Care was taken not to tear the skin of the canal while elevating the flap. Then tissues from anterior aspect of tragal cartilage were dissected off the cartilage here again taking care not to damage the perichondrium. Cartilage becomes free at incisura terminalis. (Figure 1)

![Cartilage graft being harvested](image)

**Fig. 1. Cartilage graft being harvested**

When cartilage sized of about 2 cm in length and about 1.5 cm in breadth was exposed it was cut either with knife or graft scissors starting superiorly at incisura terminalis and as medial as possible in the canal side. Like this an adequate sized graft was harvested. Incision was closed by interrupted sutures of 4/0 prolene. Keeping it over the graft block perichondrium from the cartilage in its anterior or the surface away from the canal was elevated using sharp septal or any small perichondrial elevator starting from the end cut from near the inter-tragic notch. (Figure 2)

As usual the bed was prepared in the middle ear by freshening the margins of TM and by elevation of the tympanomeatal flap either by permeatal or post-auricular approach. Malleus handle where present was well skeletonized. Haemostasis in the middle ear was achieved by use of wet cotton balls soaked with pure adrenaline. Dry gelfoam pieces were placed in the middle ear. Palisades of cartilage of different length and breadth and shapes as needed were prepared. They were placed one by one in the middle ear with intact perichondrial sides facing laterally to allow epithelialization® tucking under the margin of...
remnant of TM or medial to osseous annular rim as in underlay fashion but parallel to handle of malleus anterior and posterior to it. Surface of the cartilage without perichondrium faced medially to avoid adhesions to the promontory. First a semilunar shaped palisade of about 2-3 mm breadth in its maximum dimension was prepared and placed anteriorly near the Eustachian tube area or pro-tympanum. (Figure 3)

Second piece was placed parallel and anterior to handle of malleus in contact with the edge of the first like fitting of tiles on the bathroom floor. Third piece was placed like the second one but posterior to the handle of malleus. Fourth appropriately sized and shaped if needed was placed most posteriorly. (Figure 4) Sometimes a very small gap present between the second and the third below the handle of malleus was filled with a small piece of palisade cartilage. Tympanomeatal flap was then replaced and was medialized slightly to cover some parts of palisades. Canal was packed with wet gelfoam pieces soaked in ciprofloxacin ear drops. Ribbon pack made of umbilical cord tier medicated with bismuth iodide paraffin paste was kept in the canal. Ear was bandaged with mastoid bandage.

**POST-OPERATIVE CARE AND FOLLOW UP:**
Antibiotic ciprofloxacin 500 mgs 12 hourly was given for seven days postoperatively. Stitches were cut and ribbon pack was removed on the sixth post-operative day. After removal of pack chloramphenicol with steroid ear drop was advised for about 2 weeks period and follow up was done at eight weeks or after when graft status (Figure 6) and hearing were assessed.

**RESULTS:**
As this study is going on in the Department of Otorhinolaryngology & Head and neck surgery details are yet to be published however preliminary results from both anatomical and functional standpoint are very encouraging.

**REFERENCES:**
Thesis writing is a mandatory prerequisite for obtaining master’s degree. The post graduate trainees should enjoy this part of training, rather than taking it as a burden just to fulfill the criteria for post graduation.

The book entitled ‘How to write thesis, a complete guideline’ is a valuable guide for post graduate residents and other scholars who are interested in research.

The author of this book Dr Prakash Adhikari is an energetic young ENT consultant who has several publications in Nepal and abroad. Unfortunately, at this time Dr Adhikari is struggling for his life as he sustained severe head injury. I pray the Al mighty to bless him normal life.

The book is of 32 pages with 30 small chapters including do’s and don’ts and take home message. Being a small volume, one can revise it several times. This is a concised booklet, so for the details one has to refer to the textbook on the subject.

The book has few grammatical mistakes. It would have been much clear if the chapters would have been separated distinctly. In many places it seems that the booklet refers to only IOM trainees. I believe that these shortcomings will be overcome in the next edition. However, the price is nominal and it’s a good bye for money.

I recommend every post graduates and scholars to go through this booklet before writing a thesis.
INSTRUCTION FOR AUTHORS

Nepalese Journal of ENT Head and Neck Surgery (Nepalese J ENT Head Neck Surg) is a biannual official publication of Society of Otolaryngologists of Nepal.

Submit paper in accordance with these instructions for a quick processing and subsequent publication. The Editorial board does not necessarily agree with the views in articles published in Nepalese J ENT Head Neck Surg.

The manuscript is reviewed for publication in the Nepalese J ENT Head Neck Surg on the understanding that it has not been submitted simultaneously to another journal, has not been accepted for publication elsewhere or has not already been published. On acceptance, a manuscript becomes the copyright of the Nepalese J ENT Head Neck Surg. Manuscripts are subjected to peer review (two anonymous peer reviewers) but the Editor-in-chief reserves the right to make the final decision regarding publication and to make literary amendments wherever necessary. The proofs of the articles will be sent to the corresponding authors for minor corrections and must be returned to the journal email address via online within 2 weeks time (from the date of dispatch). Major alterations will not be accepted at this time. The Nepalese J ENT Head Neck Surg accepts the criteria for authors proposed in “uniform requirements for manuscripts submitted to biomedical journals” as published by International Committee of Medical Journal Editors (ICMJE) www.icmje.org.

A covering letter signed by all authors must accompany submission, stating that all have seen and approved the manuscript and are fully conversant with its contents. Authors must mention in the covering letter any potential or actual personal, financial or political interest they may have in the study. It should be disclosed if an abstract of the work has previously been published or if any papers using data set or relating to the same topic have been published or submitted by any of the authors for publication elsewhere. Results of multicentre studies should be reported under the name of the organization. We aim to reach decision on submitted articles within eight weeks. Rejected manuscripts will not be returned.

It is mandatory for all the authors to obtain and submit Ethical Clearance document, properly signed and scanned to the Editorial board while submitting an article. All studies (including case reports) of human subjects must contain an appropriate statement within the materials and methods section or case presentation section indicating the approval of study by the Institutional Review Board that subjects have signed written informed consent or that the Institutional Review Board waived the need for informed consent. Before your submission can be sent out for peer review, it is necessary that you address this issue of institutional review approval. This is in accordance with the International Committee of Journal Editors uniform requirements for manuscripts submitted to biomedical journals. Please see http://www.icmje.org for more details. All studies in which animals are used must contain a statement within the materials and methods section confirming approval by the Institutional Animal Care and Use committee and that the care and handling of the animals were in accord with National Institutes of health Guidelines or another appropriate internationally recognized guideline for ethical animal treatment.

MANUSCRIPTS MUST BE SUPPLIED AS FOLLOWS:
The articles to be made available online should adhere to the following format; text should be in 12pt font size, New Times Roman double spaced in Microsoft Word. The references and legends should be at the end of the text. Please provide all photographs in colour whenever possible. Photographic images must be submitted in non-compressed files with 300-dpi resolution. Place each illustration in a separate file. Although we offer a provision for submitting manuscripts via online submission at www.soinepal.org.np, for the time being, authors are encouraged to submit the manuscript via email attachment at nepalese.jenths@gmail.com

EACH OF THE FOLLOWING SECTIONS SHOULD BE IN A NEW PAGE:
Title Page
Abstract
Acknowledgement(s)
References
Illustrations

TITLE PAGE SHOULD GIVE THE FOLLOWING INFORMATION:
The article and initials of each author
● Department & institution to which the work should be attributed to
● Address, telephone & fax number, and e-mail address of the author responsible for correspondence
Details of financial support and a short title
Words appearing as medical Subject headings (MeSH) in the supplement to the index Medicus may be used as key words.

Abstract:
The second page of the manuscript should carry an abstract of less than 250 words. It should include the following sections: Objective, Materials and methods, Results and Conclusion.

Text:
Suggested Outline would be:
- Introduction
- Materials and methods
- Results
- Discussion, which should be concise & not digress from the direct results
- Conclusion

(The subheadings in text should be written in capital letters. The findings should be analysed by statistical methods and be well interpreted showing the level of significance).

Randomised controlled trials (RCTs) should be clearly identified as such. Test should be gender-neutral. Patient confidentiality must be maintained in articles and illustrations unless specific written, consent has been provided & can be provided to the journal. Papers reporting studies that relate to human investigation (e.g. controlled trials or animal experimentation are published only if the design of the work has been approved by hospital and/or national ethics committees. Research on human must conform to the standards of the declaration of Helsinki (See BmJ 194; 2057: 177). The authors should mention if there are competing interests.

Acknowledgements:
All acknowledgements including financial support should be mentioned under this heading.

Tables & Illustrations:
Ensure that all units of measurements are included and that all tables are listed in the text. If a table or illustration has been reproduced from a published work, the reference must be given with full, written permission granted by the author and by the publisher. If images (photographs/line drawings) are to be included, clearly scanned images free from technical facts should be submitted. Magnified area of key interest should be indicated by an arrow, symbol or abbreviation, with the details explained at the bottom of the figures. While doing so, the author should provide a clean duplicate image also. Captions for each image must be provided in the last page of the manuscript. Please make sure each figure is inserted in order in the text, eg. (Fig-2). Specification of the image file should be as follows.
The headings of the table should be written above and
Image file format: jpg, gif
Resolution: 300 dpi (dots per inch)

References:
References should strictly follow Vancouver system (http://www.lil.monash.edu.au/tutorials/citing/vancouver.html)
Authors must supply the complete URL for each reference as cited on Medline. Accuracy of references is the sole responsibility of the author & articles found to contain inaccuracies in references will be returned. Authors must not cite references to works they have not read without explicitly that their information derives from a secondary source. Authors must also ensure that the material is cited with the approval of the originator. Reference, numbered in the order they are mentioned in text, should be listed on a separate page. Journal abbreviations should be as listed in Index Medicus.
While citing reference, please follow the modifications as under:
Superscripts rather than brackets must be used

Numbers should be inserted to the left of column & semi-columns.
Full stops are placed before the reference number
Ensure that punctuations form is consistently applied

Examples:

Statistics and units of measurement:
Decimal points, not commas, should be used. All measurements should be expressed in SI units. Numerical data should be analysed by appropriate statistical methods and these should be mentioned clearly in the methodology section of the text. Authors are required to ensure the validity of any statistical test presented as a significant component of a submitted article.

Case Reports:
The topic should be on significant clinical relevance, important educational content and interest to journal readers. The case report should consist of:
1. a sentence or two of introduction
2. key words
3. the main body of text and discussion
4. a conclusion
5. five or less than five references (In certain cases we accept upto ten references maximum)

Images should be included with clear legends. The word length should be between 500-1000 words.

Medical Education:
Medical education section should be pertinent to the education process in the medical field. It may be about teaching learning process in undergraduate, postgraduate or higher levels.

Audits:
The audits should be written in different subheadings similar to original articles. Whether the original article submitted to the journal belongs to original article itself or is published under the section of audit finally relies on the editorial board.

Review article:
There is no need of structured abstract. Authors of review article can divide the article into different sections as favourable by discussing with the editor.

How I do it Section:
This section should describe in brief a procedure (usually a surgical one) by an eminent expert in the field. This section does not need abstract. The work may be a modification of a well established clerical procedure or can be totally new one. But the latter must have been tested by scientific means with the result being equal or superior to the clerical one. The word length should not be more than 1000 words.

Letter to Editor:
The editorial board also accepts the letter to Editor on the article published in Nepalese J ENT Head Neck Surg. While writing it, the authors must give a full reference of the article published in our journal. After acceptance, the editorial board invites for author’s response which should be sent to Nepalese J ENT Head Neck Surg within 10 days. If not received, the editorial board will write—the authors has been invited to give reply but could not be received.