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Laryngopharyngeal Reflux: A neglected diagnosis

Iqbal A. Muhammad Khyani

Laryngopharyngeal reflux (LPR) can be defined as influx of stomach contents into the upper airway especially the laryngopharynx and posterior nasopharynx. It is a clinical entity which recently gained importance whereby patient complaints of sore throat, burning throat, change of voice, foreign body sensation in throat, choking, tinnitus and hearing impairment. These symptoms usually relate with heart burn, gastritis and gastroesophageal reflux disease (GERD). These cases usually present to family physicians who treat the patient as allergy or infection and prescribe anti-histamines and antibiotics that worsen the condition due to drying effects.

The pattern, mechanism, manifestation of laryngopharyngeal reflux (LPR) and gastroesophageal reflux disease (GERD) differ. LPR patients have head and neck symptoms, but heartburn is uncommon. Consequently LPR is a silent reflux. These patients have pre-dominantly daytime reflux and normal esophageal motility. Most studies in South Central Asia were conducted in Iran. The prevalence of GERD in Iran was 6.3–18.3% from 2005 to 2010, and higher than in Eastern Asia. In Bangladesh, GERD ranged from 5.3 to 19.4%. A prevalence of 24% in Pakistan was reported in 2005. In India the prevalence of GERD was estimated at 7.6% in a large prospective multicenter study. There is evidence to suggest that changing dynamics and decrease protective factors contribute to increase severity of GERD in Asia. It is therefore of utmost importance for both primary care physicians and specialists to increase vigilance for this emerging disease. General public awareness is required to facilitate early intervention for risk factors, more accurate diagnosis, and appropriate treatment¹ Prevalence of GERD in Asian population has shown an increasing trend which is attributed to the factors like sedentary lifestyle, obesity, stress, dietary factors like high-fat diet, shorter duration of dinner to bed time, and other factors such as smoking and alcohol².

The pathophysiology of LPR is a complex interplay between abnormal function of esophageal sphincters, esophageal motility, and the efficacy of various defense mechanisms (presence of saliva, mucous barrier, and activity of carbonic anhydrase), which ultimately affect the extent and frequency of exposure to acid, bile, and pepsin on the laryngopharyngeal mucosa. Lower esophageal sphincter dysfunction and esophageal dysmotility directly contribute to prolonged esophageal acid clearance in patients with LPR³. LPR has been implicated in the etiology of many laryngeal diseases such as reflux laryngitis, subglottic stenosis, granulomas, contact ulcers and vocal nodules. The diagnosis of LPR is a very difficult task and several controversies remain regarding how to confirm LPRD. Laryngoscopic findings, especially edema and erythema, are often used to diagnose.

There are some reports indicating the development and remnant of acid producing gastric parietal cells in the foregut (neopharynx) which might get activated with certain stimulus and produce acid at aberrant sites. It has been observed that the family physicians labelled it as allergy or infection and prescribe antiallergics and antibiotics unnecessarily that are ineffective and may exaggerate the symptoms.

Management of LPRD can be divided into lifestyle modifications, medical and/or surgical treatment. Behavior changes and lifestyle modifications are considered the first-line treatment with the lowest possibility of side effects. Weight loss, smoking cessation, alcohol avoidance, meal habit modifications, and head elevation during sleep need to be strongly suggested to patients. More recently laryngeal rehabilitation therapies have been applied in cases of chronic cough associated with GERD, with significant symptom improvement. It is high time to consider this condition in the differentials of sore throat and treat the case accordingly to reduce morbidity and to improve the quality of life of the patient.

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Usefulness of Intranasal Splints In Preventing Nasal Adhesions

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**Atif Hafeez Siddiqui, **Irfan Ahmed Shaikh

ABSTRACT : OBJECTIVE : This study was conducted to assess the efficacy of intranasal splints in the prevention of intranasal mucosal adhesion following septoplasty. **MATERIAL & METHODS:** This study was conducted in Department of ENT, Combined Military Hospital (CMH), Peshawar and Civil Hospital Karachi from January 2016 to December 2016. A randomized controlled trial was performed. Total 84 cases fulfilled the inclusion criteria were included in the study. They were divided into two groups (42 in each group), Group I (splint group) and Group II (Control). All patients with deflected nasal septum underwent septoplasty surgery. After septal surgery in group I, silastic nasal splint was placed on operated side only and both the nostrils were packed with Vaseline gauze packs. In group II, both the sides were packed using Vaseline gauze packs. Vaseline gauze nasal packs were removed after 48 hrs and nasal splint was removed after seven days of surgery. All Patients were examined in outpatients department and the nasal cavities were checked for adhesions on the 15th day of the removal of splints. **RESULTS:** On 15th day of the removal of splints, mucosal status in group I was 1.45 ± 0.55 whereas in group II 2.05 ± 0.69 . Mucosal status was significantly better ($p = 0.031$) in the group I as compared with the group II. **CONCLUSION:** Insertion of a silastic septal splint after septoplasty has significantly reduced development of postoperative nasal adhesions. It should be accepted as a routine procedure in preventing postoperative nasal mucosal adhesions.

Key Words : Septal surgery, Nasal packing, Intranasal splints, Mucosal status, Nasal adhesions.

INTRODUCTION : Septal surgery is a common surgical procedure with a long history, as early as 3500BC it is documented in ancient Egyptian medical literature¹. In the literature, early treatments for symptomatic nasal septal deviation were described in 1757, where it was recommended to pinch the septum firmly with the fingers daily to bring about a gradual return of the deviated septum to the midline. The further development in the history of septal surgery was the procedure of submucous resection (SMR) in the early 1900's. Various changes to the original submucous resection procedure have been described until the 1960s, Freer and Killian had promoted submucous septal resection as standard practice². The main criticisms of the submucous resection were a high rate of complications; septal hematoma, septal perforation, external nasal deformity, the inability to correct anterior deviations, intranasal mucosal adhesions and the difficulty in performing revision surgery³. These criticisms led to the emergence of the septoplasty procedure⁴. Septoplasty is routinely performed for symptomatic deviated nasal septum. A deviated nasal septum can cause several problems, including nasal obstruction, nasal deformity, epistaxis, paranasal sinus problems, snoring and sleep apnoea. During septal surgery the mucoperichondrium is lifted and the underlying septal bone and cartilage are

straightened. The nasal septum is realigned to the midline as possible leaving the normal support of the tip of the nose intact. Once the septum is realigned the incision is closed with absorbable sutures and nasal splints may be placed and nasal packing may be done⁵.

Although the post-operative complication rate of nasal septal surgery is rather low. It includes excessive bleeding; septal hematoma; infection; septal abscess; septal perforation; nasal tip depression; saddle nose deformity; sensory changes, such as anosmia or dental anesthesia; cerebrospinal fluid rhinorrhea. Severe complications such as toxic shock syndrome, cavernous sinus thrombosis and meningitis can be life threatening. Among these complications, intranasal adhesion formation between the nasal septum and lateral nasal wall is one of the troublesome complications and is a common cause of post-operative nasal obstruction^{3,6}. Nasal splints are routinely used after nasal septal surgery to keep raw surfaces apart in order to prevent contractions and closing of the nasal airway by granulations⁷. Nasal adhesions may be developed as a result of contact between raw surfaces of operated nasal septum and the lateral nasal wall that results in partial or complete nasal obstruction of affected side⁸. Apart from septal surgery, functional endoscopic sinus surgery may

Group	Grade 1	Grade 2	Grade 3	Grade 4	Mean	P value
Group I (n = 42)	25 (59.5%)	16 (38.1%)	1 (2.4%)	0	1.45 ± 0.55	0.031
Group II (n = 42)	7 (16.7%)	28 (66.7%)	5 (11.9%)	2 (4.8%)	2.05 ± 0.69	

Table 1: Comparison of Postoperative Nasal Mucosal Status between Group I and Group II

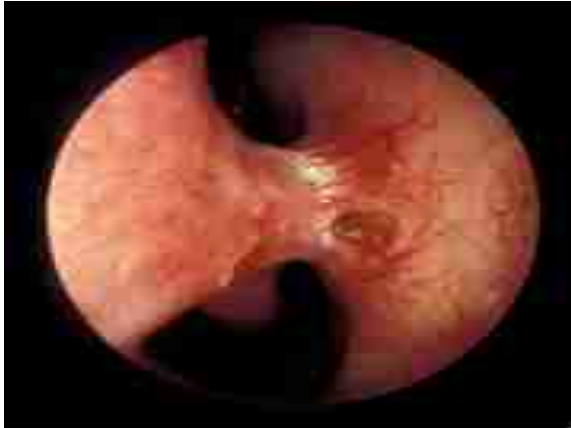


Figure 1: Adhesion between right inferior turbinate and nasal septum.

also result in adhesions formation⁹. Prevention of nasal adhesions formation is an important aspect of nasal septal surgery. To prevent the formation of these adhesions, regular nasal cleaning and meticulous nasal toilet has been advocated. Intranasal septal splints are routinely placed alongside of nasal septum to prevent contact between raw surface of septum and lateral nasal wall. In addition to this nasal septal splints are also helpful in maintaining postoperative septal stability.

First time nasal splints were used by Salinger and Cohen in 1955 to keep the septum in position after septal surgery¹⁰. Commonest reason for using nasal septal splints was to prevent of intranasal adhesions formation which was mentioned by Pringle in UK. Several types of materials have been used such as intravenous fluid containers, strips of x-ray film, the polyethylene tops of coffee cans, silicone or soft splints, wax plate splint and magnet-containing silicone rubber intranasal splints^{10,11}.

According to the Royal National Throat, Nose and Ear Hospital in London, UK, silicone is the most common material used for nasal splints¹². As though, controversy surrounds the justification of using septal splints as their use could increase postoperative pain. However, silastic septal splints have been introduced in the septal surgeries which are soft, thinner and more flexible than the previous products, thus decreasing postoperative pain. In 2012, Veluswamy et al, have compared the use of intranasal splints in septoplasty that significantly reduced formation of postoperative nasal adhesions (2.5%) to simple nasal packing (12.5%)¹³. In 2015 Abdul Khaliq KA et al, have

shown the efficacy of trans-septal suture method in preventing complications, with intranasal splinting using silicone plates after septoplasty that resulted nasal crust was seen in 2 patients and adhesion in one patient, while no such complications occurred in group 1¹⁴. In 2011 Jung YG et al have described the splint side showed a significantly a better mucosal status (1.5 ± 0.55 versus 1.9 ± 0.68 ; $p = 0.013$) than did the control side¹⁵. The aim of our study is to compare the role of nasal splints in septal surgery for prevention of nasal adhesions development between the splint and non-splint group. This study may help us in determining whether the use of nasal splints for prevention of nasal adhesions after septal surgery is justified or not.

SUBJECTS AND METHODS : A randomized controlled trials carried out on 84 adult patients in Combined Military Hospital, Peshawar and Civil Hospital, Karachi. All patients between the age group of 18–55 years of both the gender with symptomatic deviated nasal septum were included in this study. After taking an informed written consent to take part in the study, name, age, gender, serial number and hospital record number, address and phone number of each individual noted. All the patients were randomly allocated a group (I or II) by using the random numbers table-1.

All the surgeries were performed by consultant ENT surgeons under general anaesthesia, the nasal septum was infiltrated with 1% lignocaine with adrenaline, 1:100,000. A Killian's incision was made on one side of the nasal septum. The septum is approached by elevating the perichondrium flap; the various septal parts were dissected free and mobilized by chondrotomies, as required. Trans-septal matrix sutures were applied for approximation and stabilization of the mucosal flap. A silastic splint was inserted into incision side of the nasal cavity as planned, and this was fixed by a silk 4-0 in the nasal cavity to the nasal septum and secured well to avoid slippage of the splint and both the nostrils were packed with vaseline gauze packs. In group II both the nasal cavities were packed lightly with vaseline gauze. Postoperatively all patients were advised oral antibiotics, analgesics, antihistamines, decongestant nasal spray, saline nasal drops and regular nasal toilet for 5 days. There were no difference in postoperative care methods among the groups. Vaseline gauze nasal packs were removed after 48 hrs and nasal splints were removed after a mean of 8.5 days (range 7-10 days) postoperatively. All Patients were seen in out patients department and the nasal cavities were examined for adhesions on the 15th day of the removal of nasal splints. Nasal mucosal status was assessed into following four grades; Grade 1 (No erosion), Grade 2 (Focal erosion), Grade 3 (Multiple erosion) and Grade 4 (Adhesion between septum and turbinate).

Statistical analyses were performed using

Statistical Package for Social Sciences (SPSS, version 21). Wilcoxon signed-rank test was used to compare the adhesion levels and mucosal status between the splint and control groups. A p value of < 0.05 was considered statistically significant.

RESULTS : Out of 84 subjects, there were 58 male and 26 female with a mean age of 36.4 ± 6.3 years. Among 42 patients in the splint group, 25 (59.5%) had no erosion, 16 (38.1%) had focal erosion, 1 (2.4%) had multiple erosions and none of the patient was observed with adhesion between septum and turbinate (table 1). Among 42 patients in the control group, 7 (16.7%) had no erosion, 28 (66.7%) had focal erosion, 5 (11.9%) had multiple erosions and 2 (4.8%) patients were observed with adhesion between septum and turbinate as shown in figure 1. The mean mucosal status in group I was 1.45 ± 0.55 whereas in group II it was 2.05 ± 0.69 . The status was significantly better ($p = 0.031$) in the splint group as compared with the group II.

DISCUSSION : Nasal adhesion formation is a troublesome complication following nasal septal surgery. These are more commonly seen after combined surgical procedures but may also appear after a single procedure on the nose. Prevention of postoperative nasal adhesions is an important aspect of nasal surgery. To prevent the formation of these adhesions, meticulous nasal toilet has been advocated. However attempts have been made to prevent adhesions formation by inserting post-operative intra-nasal splints. Several studies showed that the results were in favor of nasal septal splints compared to simple nasal packing preventing the formation of intranasal adhesion^{16,17}. Silastic nasal splints were effective in preventing the formation of intranasal adhesion and had a significant positive effect on the septal mucosal healing process after septoplasty. Intranasal adhesions due to mucosal erosion after septoplasty could be the cause of postoperative nasal discomfort and nasal obstruction. For this reason, a silastic septal splint has long been the choice of many surgeons and the procedure has been widely used for mucosal protection. In the early postoperative period, mucosal swelling of the nasal cavity and crust formation became causes of nasal discomfort. Therefore, the insertion of a silastic septal splint did not cause significant additive discomfort during this period. Additionally, the more favorable mucosal status of the splint group in the second postoperative week resulted in significantly less discomfort during this period. Determining the grade of mucosal status, was one of the greatest difficulties of this study as there are no reference guidelines for mucosal grading system. There have been some reports regarding postoperative discomfort associated with a septal splint. It has been reported that there are no clear advantages to inserting an intranasal splint and that they should be used sparingly. However, these reports were published before the development of the current-day more

flexible and biocompatible splints. We believe that a key point for insertion of the septal splint is proper size and positioning of the splint on the septum. Gunter mentioned that splints must not touch the floor or roof of the nose. We agree with his expert opinion and thus made an extra effort to properly position the splint in all subjects enrolled in our study. As a result, our results may have favored the use of a septal splint. **CONCLUSION :** All Otorrhinologists are familiar with nasal adhesions. Formation of intranasal adhesions is a troublesome complication following nasal septal surgery. Attempts have been made to prevent intranasal adhesion formation by inserting post-operative intra-nasal splints. However, nasal splints indicated a significant decrease in the postoperative adhesions; therefore, it can be considered as the preferred technique in septoplasty.

CONFLICT OF INTEREST :

This study has no conflict of interest to declare by any author.

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Comparison of the “Success Rate of Graft Uptake in Underlay and Onlay Myringoplasty

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Danish-ur- Rahim. * Dr. Dilip Kumar

ABSTRACT : OBJECTIVE : To compare the success rate of graft uptake in underlay and onlay techniques of myringoplasty” **MATERIAL AND METHODS:** This prospective study of 124 Patients of dry central perforation of various sizes in which myringoplasty was done, conducted in the Department of ENT Unit-II, Civil Sandeman Provincial Teaching Hospital Quetta, from 1st November 2014 till 30th June 2016. All 124 patients were admitted through OPD. They were randomly divided in to two groups. In Group-A 62 patients were underwent underlay technique and in Group-B 62 patients were underwent onlay technique of myringoplasty and the success rate of graft was noted on microscopic examination postoperatively. **RESULT:** The overall success rate was 82% (102 Patients out of 124 Patients) while the overall failure rate was 24% (16 Patients out of 124 Patients). The failure rate in underlay technique was 9.7% (6 Patients out of 62 Patients) as compared to only technique which was 24% (16 Patients out of 62 Patients). The complications rate was less in underlay technique as compared to only technique. Hearing was also improved in underlay technique. **CONCLUSION:** In our study the “success rate of graft” in underlay technique was better than the onlay technique. The result of hearing was also better in underlay technique.

Key Words : Myringoplasty, Underlay technique, Onlay technique.

INTRODUCTION : Myringoplasty is an Otolological surgical procedure in part of tympanic membrane is repaired^{1,2}. It is done for perforated tympanic membrane. It prevents recurrent ear discharge and improves hearing. It is also useful in swimmers and in those who use hearing aids. Most common cause of tympanic membrane perforation is chronic Otitis media³. Two types of myringoplasty are usually performed. One is underlay technique and the other is onlay technique. In this study we will compare the take rate of graft of underlay and onlay techniques of myringoplasty so that we can know the better option. The surgical closure of perforated tympanic membrane by skin graft and used the term “Myringoplasty” for the procedure by Debnath^{4,5}. It was not widely accepted at that time. Myringoplasty was further developed by Kamath⁶. Otolologist then re-introduced myringoplasty and with improvement of optics, good surgical techniques and introducing of microsurgery, myringoplasty was performed with great safety and improved graft survival^{7,8}. Pre-requisites for myringoplasty were considered strictly i.e. dry ear, good eustachian tube function, and absence of infection in nose, paranasal sinuses & throat and cochlear reserve. Initially the ENT surgeons used onlay technique, but there was a lot of complications i.e. lateralization of graft, formation of cholesteatoma and blunting of graft at anterior angle⁹. The otologist then re-introduced the underlay technique of myringoplasty and with the passage of time underlay technique was used more frequently by different otologist and good

take rate of graft were obtained of over 92%^{10,11}. In spite of these two techniques there are also other techniques for myringoplasty, which includes interlay, fatplug and sandwich techniques for small perforations¹². There are many reports regarding the success rate of myringoplasty techniques (35%-95%)¹³. The rationale of our study is otitis media is commonly prevailed in our society that was resulted in perforated ear drum in most of the cases. Perforated tympanic membrane may result in repeated source of infection. Previously they were managed by onlay technique in our department despite of strong recommendations for underlay technique in literature. This study has been planned to compare the success rate of the two techniques i.e onlay and underlay. If the success rate of underlay is found to be better, then it will be adopted for management of tympanic membrane perforation in all cases coming to our OPD/ department.

MATERIALS AND METHODS : All 124 patients were admitted through OPD having various size perforations in pars tensa part of their tympanic membrane, diagnosed on basis of history, clinical examinations and by microscopic examinations. Eustachian tube function was assessed by Valsalva method; Tuning fork tests and pure tone audiometry were also performed. This study was conducted in ENT department Unit-II, Civil Sandeman Provincial Teaching Hospital Quetta, from 1st November 2014 to 30th June 2016 (Fig 1). The age range of patients was 20-30 years with the mean age of 30+-. Microscopic findings about

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perforation were recorded in detail. Patients of both sexes, age above 20 years and less than 40 years of large perforation in ParsTensa part of tympanic membrane, who fulfilled the pre-requisites were included. Patients with wet tympanum and who has loss of cochlear reserve were excluded. All patients were randomly divided into two equal groups, 62 patients in each group using the table of randomization. 124 patients were randomly divided into two groups, 62 in each group. In 62 patients' myringoplasty was done by underlay technique and in remaining 62 patients it was done by onlay technique. Temporalis fascia was used for grafting in all patients. All surgeries were done under general anesthesia. For onlay technique endomeatal approach was used and for underlay technique the post auricular approach was used. In onlay technique the graft is placed lateral to annulus where as in underlay technique the graft is placed medial to annulus and over handle of malleus. Gelfom was placed in middle ear cavity and in external auditory canal. Patients without any immediate complications were discharge on medications on second postoperative day. Fortunately all patients were available postoperatively for evaluation, initially weekly, 3 monthly, 6 monthly and yearly after surgery. Patients were assessed by microscope and pure tone audiometry for better and worse outcome in myringoplasty of both types. Patient of intact graft were consider better outcome and patients of graft rejection were considered bad outcome. The frequencies of good and worse outcome were calculated to test the hypothesis that the success rate of graft is higher in underlay technique as compared to onlay technique.

Data were entered and analyzed by using SPSS version 20.0. Mean $\pm$ std deviation of age of all patients were calculated. Male to female ratio was calculated. Frequencies of good outcome and worse outcome of underlay and onlay techniques were calculated and compared by applying chi square test =0.05 was considered as significant.

RESULTS: During follow-up of all 124 patients underwent myringoplasty by underlay and onlay technique, 56 patients (90%) out of 62 patients operated by underlay technique showed good outcome as compare to 46 patients (76%) out of 62 patients operated by onlay technique. 6 patients (9.7%) out of 62 patients in underlay techniques showed worse outcome as compare to onlay technique which showed worse out come in 16 patients (24%) (Fig 1). The overall success rate was in 102 patients (76%) out of 124 total patients and the overall failure rate was in 22 patients (33.7%) out of total 124 patients (Table 1). The outcome in underlay technique was favorable (better) than the onlay technique and should be offered to all large Perforation in ParsTensa part of tympanic membrane, who fullfills the pre-requisites for myringoplasty. The failure of graft in underlay technique was due to medial prolapse of graft in 2 patients (3.2%) out of 62 patients, postoperative infection occurred in 2 patients (3.2%) out of 62 patients and Sensori neural hearing loss occurred in 2 patients (3.2%) out of 62 patients. In onlay

technique the failure of take rate of graft was due to anterior blunting of tympanic membrane in 6 patients (9.7%) out of 62 patients, lateralization of tympanic membrane occurred in 2 patients (1.2%) out of 62 patients and postoperative infection occure in 1 patient (1.1%) out of 62 patients. The overall failure rate in onlay technique in 16 patients (24%) out of 62 patients and was in 6 patients (9.7%) out of 62 patients in underlay technique. Frequencies of good and worse outcome in underlay and onlay techniques were compared by applying chi square test. P value obtained was less then 0.05 ($p < .05$) which is significant. Thus the take rate of graft in underlay technique was better (90%) as compare to onlay technique (76%). Total patients were 124 inwhich 75 were male and 49 were female, with male to female ratio of 1.5:1. The age range of patients was 20-30 years with the mean age of 30+-.

	with good outcome	with worse outcome	Totals No. of Patients
Underlay	56 (90%)	6 (9.7%)	62
Onlay	46 (76%)	16 (24%)	62
Totals	102	22	124

Table 1 : Outcome Of Graft Uptake In Underlay And Onlay Techniques Of Myringoplasty.

The chi-square statistic is 5.5258. The p-value is .018738. This result is significant at $p < .05$.

The chi-square statistic with Yates correction is 4.4759. The p-value is .034375. Significant at $p < .05$.

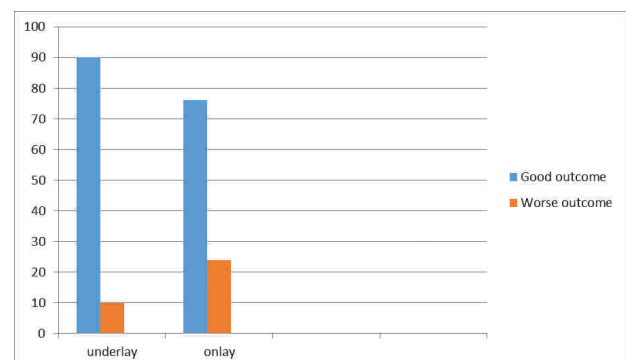


Figure1: Comparision of outcome of underlay and onlay techniques.

DISCUSSION: The ideal reconstruction of tympanic membrane should obtain a thin, conically shaped, vibrating membrane replacing the original eardrum to prevent ear infections and restore or improve hearing. The underlay and onlay techniques of myringoplasty have attracted much discussion. There is still no consensus made about optimal technique both types have advantages and disadvantages. The onlay technique is being easier and less time consuming but there is risk of cholesteatoma pearl formation, lateralization of graft and blunting of the anterior angle⁹. The underlay technique has advantage of inspection of ossicular chain. Its disadvantages are medial prolapse of graft, ossicular damage and retraction of the anterior angle. By comparing the compliance, both techniques postoperatively

showed no statistically significant difference. This disproves the claim of some authors that the graft in underlay technique narrows the middle ear cavity and thus reduces the ear drum compliance¹⁴. Different materials can be used for grafting like fat, perichondrium, periosteum, fascia lata, vein, cartilage and temporalis fascia. We used temporalis fascia for grafting in all cases as it is easy to take, has large surface area, easily available, has a low metabolic rate and does not require any special preparation¹⁵. In Sarkar, study in 2013, the take rate of underlay technique was better than onlay technique¹⁶. Sergi in 2011 and Kalsotra in 2014, reported 91.5% success in underlay as compare to onlay which showed 91% success rate^{13,17}. In our study the overall success rate is 82% which can be compared formally with 80.2%. Elsheikh reported a success rate of 95.6% in onlay graft and 88.8% is underlay graft¹⁸. Phillips and Yung reported a 97% take rate in onlay technique¹⁹. Recently Alain, Esmat published a retrospective study in which they achieved an 82.1% and 85.1% take rate with onlay and underlay techniques respectively^{20,21}. Our study outcome is near to similar to those reported by Sergi and Kalsotra¹⁷. Some of our patients develop sensori neural hearing loss (high frequencies) in underlay technique which was due to accidental mobilization of ossicles and in the majority of patients the hearing improved with good outcome of graft²². The complications rate was also less in underlay as compared to onlay technique¹⁶. In our series we have achieved a high rate of success in both techniques although the underlay technique was better than onlay technique in term of tympanic membrane closure (take rate of graft). The high success rate in underlay is probably due to less surgical manipulation of middle ear structures and due to faster healing. In underlay technique the hearing was also better as compared to onlay technique^{11,23}.

CONCLUSION : In conclusion both underlay and onlay techniques of myringoplasty may be used safely in most of the patients but comparatively underlay technique is the better option and first choice for repair of various sizes of tympanic membrane perforation. our study showed that the underlay technique of myringoplasty has a better success rate of graft and less complication as compared to onlay technique in various sizes of perforation of tympanic membrane.

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Assessment of Developmental and Behavioral Issues of Prelingually Deaf Children Before Considering Candidacy for Cochlear Implant

Muhammad Adnan Anwar, Hafiza Munaza Hayat, Atia ur Rehman, Farhan Akber, Noreen Anwar, Tahira Nomani, Sidra Khalid

ABSTRACT : *OBJECTIVES :* Introduction: Since last 20 years, hard of hearing kids with psychological abnormalities undergoing cochlear implants surgery has increased drastically. However, compared to the extensive results of speech & language outcomes following implantation may show that although these children have significant improvement in their hearing ability, but they continue to have poorer spoken language outcomes comparatively and fail to keep pace with their normal developing peers. *OBJECTIVE:* To determine frequency of associated behavioral and developmental co-morbidities in prelingually deafened children seeking cochlear implant. *PLACE A DURATION OF STUDAY:* Study design cross sectional study. *MATERIAL & METHODS:* The study was conducted among 50 candidates who submitted their application for cochlear implantation. Data was collected from parents through structured questionnaires based on DSM V and Portage guide checklist. This obtained data was then statistically analyzed using SPSS version 20 and presented in the form of frequencies and percentages. *RESULTS:* It was found that 40% of study's participants were suffered from some sort of behavioral and developmental abnormalities. *CONCLUSION:* High proportions of behavioral and developmental disabilities were present among candidates of cochlear implant. Considering post-implantation outcome of these children, it is essential for cochlear implant team members to assess multidisciplinary pre-implant evaluation in order to preclude such co-morbidities and counseled the family about possible outcome before implantation. **Key Words :** Autism, ADHD, Developmental disabilities, Deafness, Cochlear Implant.

INTRODUCTION : Among the most common health problems, hearing loss is one found commonly in children. Two to three babies per 1,000 births were diagnosed with bilateral moderate to profound hearing loss, increasing to about 6 in 1,000 in school-aged children¹. Out of these, 30-40% of kids with sensorineural deafness founds to have associated multiple disabilities that can have profound implications on communication and related visual, motor, cognitive and behavioral development². Children with profound hearing impairments that do not have benefitted from hearing aids may be a candidate for cochlear implant. A cochlear implant system could only be a medical possibility for such individuals³. Progress has been shown in areas of spoken language, speech perception, attention and behavioral development⁴. However, the difference in performance vary between the individuals, thus, the success of cochlear implantation needs careful consideration of intervening variables. Recent studies show that hearing impaired children who have had worse language skill, also have a higher proportion of behavior problems^{5,6}. Numbers of hearing impaired kids with associated co-morbidities receiving cochlear implants have increased considerably since last few years (an estimate of about 30 to 40%)⁷. Earlier identification of hearing loss and reduction in age criteria for

implant from 24 to 12 months by FDA, results in increase number of implantation before the identification of certain disabilities (Autism, ADHD)⁸. Outcome of longitudinal studies in these children have shown that a cochlear implant leads to gains in oral language but at slower pace than their peers without associated disabilities. However, the ideal conditions to achieve these benefits up to the maximized value yet to be understood^{9,10}. In assessing the psychological profile, a clinical psychologist assesses each candidate with several normative behavioral measures. Although there is little doubt that delayed development affects spoken language acquisition, since it is not clear if such psychological measures predict cochlear implant outcomes in children with severe development deficiencies¹¹. Venail et al. in 2010 reported that approximately 60% cochlear implant recipients with addition disabilities were found to have delayed reading and writing skill and almost 80% of them failed in grade one examination. 50% of children aged 5 to 10 years were enrolled in primary education, while 25% of children were enrolled in high school between 12 and 15 years of age. Nearly 20% use only sign language; Forty percent used only oral language and remaining used combination of all modalities following implantation. For children studying in high school,

Variables	F	%
Gender		
Male	28	56.0
Female	22	44.0
Residence		
Urban	26	52.0
Rural	24	48.0
Total	50	100.0
Age		
M = 2.60, SD = 1.04		

Table 1: Demographic distribution of participants of study.

Variables	F	%
ADHD	05	10.0
Autistic Behavior	07	14.0
Developmental Delay	18	36.0
Both Autism & ADHD	2	4.0
Both Autistic & delayed development	5	10.0
Both ADHD & delayed development	02	4.0
Both Beh. & Dev.	01	2.0
Total participant with disorder	20	40%

Table 2: Frequency of associated psychological problems among study's participants.

additional educational support and speech therapy were needed even after 16 years of age¹². Autism Spectrum Disorder continues to be a category where cochlear implant teams use great caution when holding a child for an implant. Normal hearing children with autism usually have great difficulty in effective communication and developing spoken language skills. It is therefore not surprising that deaf children with autism are generally not good candidates for cochlear implantation¹³. Jure et al reported that 4% of children in a school for deaf children met the diagnostic criteria for autism¹⁴. According to Gallaudet Research Institute; prevalence of profoundly deaf children with coexisting ASD was 35.4%. In 2009 and 2010, the annual Deaf and Hard of Hearing survey found that one of 59 deaf children also received ASD treatment services¹⁵. Global developmental delays often lead to some cognitive or learning delay. Children who have more advanced development show faster speech acquisition, language development and get more audiological skills with a cochlear implant than their age peers with delayed developmental milestones¹⁶. This gives the impression that a child with mild cognitive delay can achieve quantifiable progress similar to their normal development peers. However, with severe development delays, the results are much less favorable¹⁷. The results of cochlear implants in children with concurrent psychological abnormalities are controversial. The fact that pre-implantation behavioral functioning and developmental profile would be related to the post implantation outcome, this present study was directed to determine the prevalence of behavioral and developmental disabilities in a sample population of children seeking cochlear implant.

METHODOLOGY :

Study Design

Cross sectional study.

Study Duration

Conducted from January 2016 to June 2016.

Sample Size

The Open Epi, Version 3,¹⁸ was used to calculate the sample size of the current study by using 95% level of significance and 15.04% as expected proportion of psychological abnormalities¹⁹. The sample size obtained was fifty (n=50).

Sampling Method

Purposive Sampling Technique was used to draw sample.

STUDY SETTING : Samples were collected from 50 profoundly deaf children, who had submitted their application to Private organization, 'Audiology Centre, Lahore', for cochlear implantation.

Inclusion Criteria : Both male and female participants with age ranges from 1 to 5 years were included in this study. They had profound degree of sensorineural hearing loss and had already used hearing aids with no improvement in speech perception²⁰.

Exclusion Criteria : Mentally retarded children or those who were not medically fit for surgery were excluded from this study²⁰.

Data Collection Technique : Structured questionnaires based on DSM V and Portage guide checklist was used to collect data from parents of the participants. Obtained data was finally compared with behavioral and developmental assessment reports of Psychiatrist in order to confirm diagnosis, so to avoid any misleading results.

Data Analysis : The obtained data was statistically analyzed by using the Statistical Package for the Social Sciences (SPSS) version 20 and presented in the form of percentages and frequencies. The research was exempted from the need for review by the responsible ethical review board of University of Lahore.

RESULTS : The sample consisted of 28 male and 22 females aged 1-5 years, mean age was calculated as 2.60. Twenty six (26) candidates belongs to urban areas while 24 of rural areas (Table 1). Based on psychological profile, 40% of study's participants were found to have some sort of behavioral and developmental abnormalities. 36% have delayed developmental milestones, 14% have autistic disorder while 10% found to have ADHD. Among these, 04% have both autistic and ADHD, 10% have both autistics and developmental, 04% have both ADHD and developmental, while 2% was found to have all above mentioned abnormalities (Table 2).

DISCUSSION: Cochlear implant helps profoundly deaf children to live their life in healthy way as normal hearing children do. It maximizes their auditory capacity so that they can use oral-aural approach for day to day communication as used by general population throughout world. But deaf children with associated co-morbidities have poor

outcomes in term of speech and language acquisition following cochlear implantation. Therefore, this present study was directed with a specific end goal to determine the prevalence of behavioral and developmental disabilities in a sample population of children seeking cochlear implant.

The aim of this cross-sectional research was to determine the feasibility and advantage of routine evaluation of the psychological profile of cochlear implant candidates in order to maximize post implantation speech and language development. Although the present study was focused on small group of children who submitted their application for implantation to one of the cochlear implant centre of Pakistan, still that 40% of sample were found to have associated co-morbidities beside their hearing deficiencies. This was consistent with the work of Hindley P²¹, who found 40% incidence of mental health problems in deaf community models. Harry Knoors and Mathijs P. J. Vervloed²² suggested that deaf children are 1.5 to 2 times more vulnerable to mental health problems and they found prevalence of additional co-morbidities among deaf children to be 30%. Finding of their studies are consistent with result of current studies which suggest 40% of the study population have some sort of additional disabilities in addition to their hearing loss. Ulf Rosenhall et al.²³ in 1999 conducted a study to determine frequency of hearing impairment among children diagnosed with autism. Their result shows that 13% of autistic children have hearing loss of varying degree. He concluded that all autistic individual must be referred for auditory evaluation before referring for aural rehabilitation. Result of their study also provides support for the result of current study where prevalence of autism was found to be 14%. Prevalence of ADHD in current study was found to be 10%. Out of which 4% of participants were found to be suffered from inattention problems only while 2% were found to have only hyperactivity disorder order and 4% of ADHD children have both inattention and hyperactivity problems. This was consistent with work of Desmond P. Kelly, Brian J. Kelly, Michael L. Jones et al²⁴, that reveals 14.1% of participants with hereditary deafness to be suffered with some kind of Attention deficit hyperactive disorder. According to an estimate, developmental disorder was found in 12 to 16% of American Children²⁵. Another estimates about 17% of developmental disabilities found in deaf children²⁶. But unfortunately, no studies specifically done on deaf children with developmental disabilities that determines the prevalence of developmental disabilities in children with profoundly deaf hearing loss. The current studies suggest a high prevalence of developmental disabilities found in children with profound hearing loss that is 36%, which mean that a high number of children have some sort of developmental disability either in any domain of developmental milestones.

Results of this study clearly showed that a non-negligible number of children were found to be affected by either kind of behavioral or developmental disorder. This emphasizes the importance of preliminary assessment of all hard of hearing candidates, before finalizing candidacy for cochlear implantation.

CONCLUSION : The present study reveals that a remarkable prevalence of associated co-morbidities, in terms of behavioral and developmental disabilities was found in profoundly deaf children seeking cochlear implant. Although current study should be considered as a preliminary analysis, the data strongly suggest that psychological variables may play a role in the auditory results following a cochlear implant. Comparing the results of previously done reviews that deaf children with co-morbidities gained slower progress in speech and language development following implantation, it is essential for cochlear implant team members to extensively assess multidisciplinary pre-implant evaluation in order to preclude such co-morbidities. For each deaf child undergoing cochlear implant surgery, it is important that families have realistic expectations about its benefit. The importance of our research will help in better counseling of family about the possible outcomes before their surgery. If there are preoperative risk factors related to additional disabilities, it's helpful for consultant to inform the family about the possibility of additional co-morbidities affecting the performance of the cochlear implant. Identifying these risk factors before implantation will also allow the consultant to monitor these children more closely, ensure early detection of any other defect and optimize other early intervention services.

CONFLICT OF INTEREST : This study has no conflict of interest to declare by any author.

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**6th BULGARIAN - ITALIAN RHINOLOGY MEETING
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To Assess Frequency of Inconclusive Biopsy in Oral Squamous Cell Carcinoma: A Diagnostic Dilemma

Saifullah Mir, Atif Hafeez Siddiqui, Iqbal A. M. Khyani,
Irfan Ahmed Shaikh, Danish ur Raheem, Tariq Zahid Khan

ABSTRACT : *OBJECTIVES :* To Determine the frequency of inconclusive histopathology reports in patients undergoing punch biopsy which are suspicious for malignancy and to determine the factors involved that leads to inconclusive reporting *SETTING:* Department of Otorhinolaryngology & Head and Neck Surgery Dow University of Health Sciences, Dow Medical College, Civil Hospital, Karachi, Pakistan. *DURATION:* Twelve months from November 2015 to October 2016. *STUDY DESIGN:* Cross-sectional study. *SUBJECT AND METHODS:* A total of 175 patients presenting with clinically frank malignant lesion of the oral cavity were included in this study. The punch biopsies specimens were sent for histopathology of the subjects meeting the inclusion criteria. The report was reviewed by the surgeon to determine the frequency and the factors involved in inconclusive histopathological reports in spite of strong clinical suspicion of malignant growth. *RESULTS:* The average age of the patients was 47 ± 10.47 years. Frequency of inconclusive histopathology reports in patients underwent punch biopsy was 16 (9.14%). Factor leading to inconclusive histopathology reports are less experience 93.78% (15/16), Tangential Cuts 56.3% (9/16) and superimposed fungal infection 43.8% (7/16). *CONCLUSION:* We conclude that the consequences of inconclusive histopathology reports have included inability to render a diagnosis and sometimes negative clinical implications for patients. Patient may be subjected to unnecessary treatment with its attendant risk, wastage of resources, to repeated biopsies, avoidable mortality and morbidity as well as anxiety among the populace about the health-care delivery system as a whole.

Key Words : Oral cavity, Punch biopsy, Inconclusive histopathology.

INTRODUCTION : Any lesion appearing in oral cavity should be carefully evaluated while clinical diagnosis must be confirmed through different procedures^{1,2}. To date, punch biopsy or open surgical biopsy has remained the gold standard for obtaining tissue for the diagnosis of suspicious lesions of the oral cavity, oropharynx, and nasopharynx³. In this context, the use of cytopathology in the diagnosis of oral and oropharyngeal lesions is not being commonly practiced and microscopic analysis is accepted as a accurate procedure to diagnose most of lesions⁴⁻⁵. The exact identification of the nature of oral lesions would be feasible only with histopathologic evaluation of tissue specimens taken from the patient^{1,6}. In addition, early diagnosis of malignant oral lesions is only possible by histopathological examination, which dictates and predict the post treatment prognosis¹. Oral cancer is considered as a major health problem with increasing incidence and mortality rates in various parts of the world especially in developing countries like Pakistan due to increasing habits of chewable tobacco products. Early diagnosis of oral cancer makes it possible to apply various treatment modalities and shorter period of care with more favorable prognosis⁷. Therefore, a delay in

diagnosis or referral might have a great effect on mortality and morbidity associated with oral cancer⁸. Selection of site of biopsy is of paramount importance along with, correct implementation of the biopsy technique, proper fixation, transport and submission of specimen to the laboratory. Transfer of adequate and complete clinical information to the pathologist by the practitioner is of paramount Important to achieve optimal results⁹. In a study (5.9%) punch biopsies specimens out of a total of 152 were not of sufficient size and results were inconclusive. Tangential cuts were reported 5(3.2%) cases out 152 cases. Super imposed fungal infection was reported in 1(0.6%) case out of 152¹⁰. The rationale of the study is that there is no precedence study in our region and even international data is scarce. As there is paucity of local data pertaining to the factors responsible for inconclusive histopathology reports in highly suspicious oral malignant looking lesions in our setup. Therefore the present study is designed to assess the burden of inconclusive results of punched biopsy in oral cavity lesions, so that strategies could be devised for improvement in the process and accurate diagnosis in one go could lead to reduce morbidity & cost.

ORIGINAL STUDY WORK :

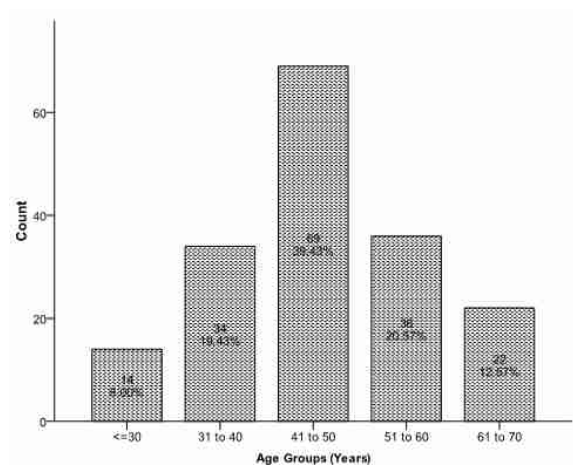


Figure 1 : Age distribution of the patients. N=175

Statistics	Age (Years)	Experience of surgeon (Years)
Mean	47.0	4.51
Std. Deviation	10.47	2.55
95% Confidence Interval for Mean	Lower Bound 45.44	4.13
	Upper Bound 48.56	4.89
Median	47	5
Inter quartile Range	16	4
Minimum	25	1
Maximum	70	9

Table 1 : Descriptive statistics of age and years of experience of surgeon.

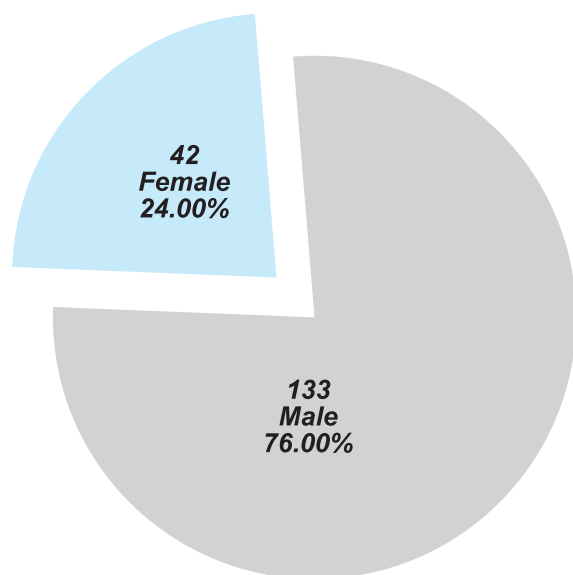


Figure 2 : Gender Distribution of the patients. N=175

OBJECTIVE: The objective of the study is to:

- Determine the frequency of inconclusive histopathology reports in patients undergoing punch biopsy which are suspicious for malignancy.
- Determine the factors involved that leads to inconclusive reporting.

OPERATIONAL DEFINITION: Oral Cavity Cancer: presence of highly suspicious malignant oral cavity lesions with the appearance of:

- Infiltrative: a small ulcer with an extensive sub-epithelial firmness leading to a raised area with ulceration
- Exophytic: a large ulcer tending to grow outward beyond the surface epithelium from which it originates
- Verrucous: An ulcer with elevated fungating edge, with a soft base which is infiltrated with a seropurulent secretion.
- Flat: An ulcer with everted margins and a shallow base

Inconclusive Histopathology: Punch biopsy results were reported by histopathologist as inconclusive due to insufficient evidence of carcinoma at cellular level with lack of invasion in a clinically frank malignant lesion.

SUBJECTS AND METHODS: Setting: Department of Otorhinolaryngology & Head and Neck Surgery Dow University of Health Sciences, Dow Medical College, Civil Hospital, Karachi, Pakistan.

DURATION: Twelve months from November 2015 to October 2016

Sampling Technique: Non- probability consecutive

Sample Selection:

Inclusion criteria:

1. The patients presenting in our outpatient department with clinically frank malignant lesion of the oral cavity of the following types:

- Infiltrative
- Exophytic
- Verrucous
- Flat

2. Both Genders

3. Any age (20-70 years)

Exclusion criteria:

- Patients with clinically diagnosed oral premalignant lesions(leukoplakia , erythroplakia , submucous fibrosis & lichen planus):
- Patients with overt oral candidiasis.
- Patients who are HBV/HCV positive assessed on laboratory screening
- Patients who do not consent to the procedure
- Suspected recurrence in post treatment cases

STUDY DESIGN: A cross-sectional study.

Sample Size:

The magnitude of inconclusive biopsy results taken as 3.5% (10) round of to 4%, confidence level 95%, margin of error taken as 3.5% and the sample of 175 oral cavity specimens were required measured by G power 8 computer software.

DATA COLLECTION PROCEDURE : After taking informed consent (annexure 1) personal information and demographic and relevant clinical information of the recruited subjects was recorded on approved performa (annexure 2) The punch biopsies specimens were sent for histopathology of the subjects meeting the inclusion criteria. The experience of surgeon was also taken into account and the sample labeled and sent for histopathology. The report was reviewed by the surgeon to determine the frequency and the factors involved in inconclusive histopathological reports in spite

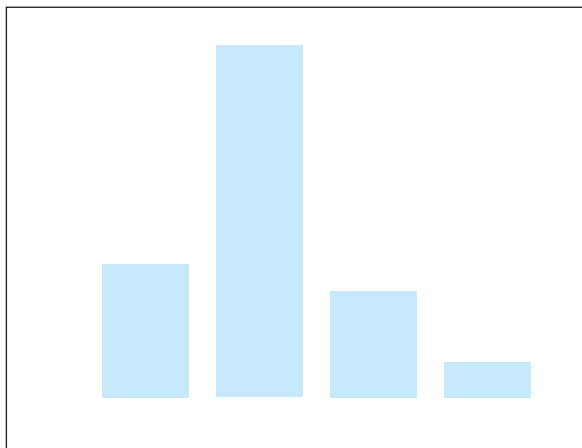


Figure 3 : Type of Lesion. N=175

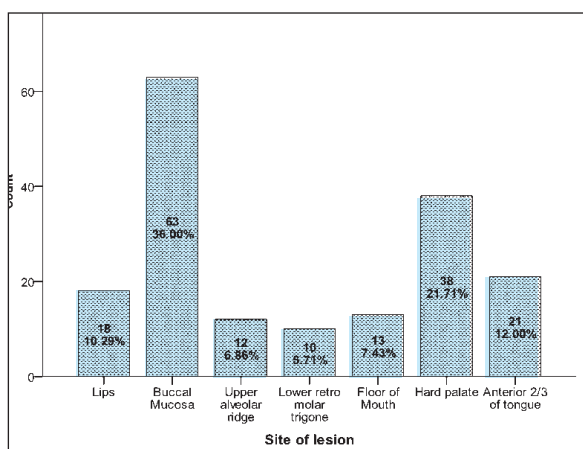


Figure 4 : Site of Lesion. N=175

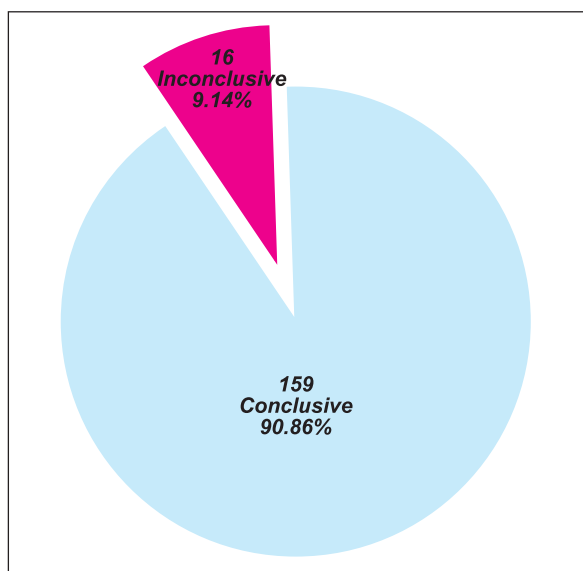


Figure 5 : Frequency Of Inconclusive Histopathology Reports In Patients Undergoing Punch Biopsy Which Are Suspicious For Malignancy N=175

Factors	Frequency	Percentage
Experience of the surgeon		
= 2 Years	15	93.8%
>2 Years	1	6.3%
Tangential Cuts	9	56.3%
Superimposed fungal infection	7	43.8%

Table 2 : Factors involved that leads to Inconclusive Reporting. N=16

Histopathology Reports				
Age Groups	Inconclusive	Conclusive	Total	P-Value
= 30 Years	2(14.3%)	12(85.7%)	14	0.457
31 to 40 Years	1(2.9%)	33(97.1%)	34	
41 to 50 Years	7(10.1%)	62(89.9%)	69	
51 to 60 Years	5(13.9%)	31(86.1%)	36	
61 to 70 Years	1(4.5%)	21(95.5%)	22	

Table 3 : Frequency of Inconclusive Histopathology Reports in Patients Undergoing Punch Biopsy which are Suspicious for Malignancy by Age groups. N=175

Histopathology Reports				
Gender	Inconclusive	Conclusive	Total	P-Value
Male	11(8.3%)	122(91.7%)	133	0.457
Female	5(11.9%)	37(88.1%)	42	

Table 4 : Frequency Of Inconclusive Histopathology Reports In Patients Undergoing Punch Biopsy which are Suspicious for Malignancy by Gender . N=175

Histopathology Reports				
Gender	Inconclusive	Conclusive	Total	P-Value
Male	11(8.3%)	122(91.7%)	133	0.457
Female	5(11.9%)	37(88.1%)	42	

Table 5 : Frequency of Inconclusive Histopathology Reports in Patients Undergoing Punch Biopsy which are Suspicious for Malignancy by Type of lesion. N=175

Histopathology Reports				
Site of Lesion	Inconclusive	Conclusive	Total	P-Value
Lips	1(5.6%)	17(94.4%)	18	0.082
Buccal Mucosa	11(17.5%)	52(82.5%)	63	
Upper alveolar ridge	1(8.3%)	11(91.7%)	12	
Lower retro molar trigone	0(0%)	10(100%)	10	
Floor of Mouth	2(15.4%)	11(84.6%)	13	
Hard palate	1(2.6%)	37(97.4%)	38	
Anterior 2/3 of tongue	0(0%)	21(100%)	21	

Table 6 : Frequency of Inconclusive Histopathology Reports In Patients Undergoing Punch Biopsy which are Suspicious for Malignancy by Site of lesion. N=175

Age Groups						
Factors	=30 n=2	31to40 n=1	41 to 50 n=7	51 to 60 n=6	>60 n=1	P-Value
Experience of the surgeon						
= 2 Years	2	1	7	4	1	0.672
>2 Years	0	0	0	1	0	
Tangential Cuts	0	0	6	3	0	0.106
Superimposed fungal infection	2	1	1	2	1	0.106

Table 7 : Factors involved that leads to Inconclusive Reporting by age groups. N=16

Factors	Gender		P-Value
	Male n=11	Female n=5	
Experience of the surgeon			0.486
= 2 Years	10	5	
>2 Years	1	0	
Tangential Cuts	5	4	0.197
Superimposed fungal infection	6	1	0.308

Table 8 : Factors involved that leads to Inconclusive Reporting by Gender. N=16

Factors	Gender				P-Value
	Infiltrative n=4	Exophytic n=9	Verrucous n=3	Flat n=0	
Experience of the surgeon					
= 2 Years	4	8	3	0	0.661
>2 Years	0	1	0	0	
Tangential Cuts	2	5	2	0	0.906
Superimposed fungal infection	2	4	1	0	0.903

Table 9 : Factors involved that leads to Inconclusive Reporting by Type of lesion. N=16

Factors	Gender							P-Value
	Lips n=1	Buccal n=11	Upper alveolar ridge n=1	Lower retro molar trigone of Mouth n=0	Floor palate n=2	Hard n=1	Anterior 2/3 of tongue n=0	
Experience of the surgeon								
= 2 Years	1	10	1	0	0	0	0	0.975
>2 Years	0	1	0	0	2	1	0	
Tangential Cuts	0	7	0	0	2	0	0	0.226
Superimposed fungal infection	1	4	0	0	2	0	0	0.111

Table 10 : Factors involved that leads to Inconclusive Reporting by Type of lesion. N=16

of strong clinical suspicion of malignant growth. **DATA ANALYSIS PROCEDURE:** Data was organized and entered on SPSS version 20. Mean $\pm$ SD was calculated for age and experience of the surgeon. Frequency and percentage were calculated for the inconclusive report, type and site of the lesion. Stratification with respect to age of the patients, gender, type of lesion and site of the lesions was done to assess the effect of these on inconclusive histopathology report. Post stratification chi-square test was applied; $P = 0.05$ was taken as significant.

RESULTS : A total of 175 patients presenting with clinically frank malignant lesion of the oral cavity were included in this study. Age distribution of the patients is shown in figure 1. The average age of the patients was 47 ± 10.47 years (table 1). There were 133(76%) male and 42(24%) female as shown in figure 2. The most common type of lesion was exophytic lesion that was observed in 99(56.57%)

as presented in figure 3. Buccal mucosa and hard plate was the commonest site as shown in figure 4. Frequency of inconclusive histopathology reports in patients underwent punch biopsy which are suspicious for malignancy is shown in figure 5 in which 16(9.14%) biopsy specimens were reported as inconclusive. These Incisional biopsy was later performed to get a definitive sample were the carcinoma was found to be present in all 16 patients. Factor leading to inconclusive histopathology reports are less experience 93.78% (15/16), Tangential Cuts 56.3% (9/16) and superimposed fungal infection 43.8% (7/16) as shown in table 2.

Stratification analysis was performed and frequency of inconclusive report and its factors were observed with respect to age, gender, type of lesion and site of lesion but insignificant effect of reported as shown in table 3 to 10.

DISCUSSION: The oral cancers are the most aggressive form of the malignant lesions as they have great potential for metastasis to the local regional lymph nodes and adjoining perioral tissues due local invasive characteristic. The disease pattern and even the treatment protocols consequently cause disfigurement and effects quality of life of the individual very adversely. Its survival rate is low and recurrence is very high along with its mortality and there is associated high cost of the treatment^{11,12}. Any lesion appearing in oral cavity should be carefully evaluated, early diagnosis of some oral lesions, especially various malignancies, is only possible by taking biopsy specimens. Several studies have addressed the issue of specimen adequacy; however, opinions vary between different authors and there are no clearly defined criteria. The majority of researchers believe that proper knowledge, ability and sufficient expertise in relation to the recognition of symptoms and signs of malignant and premalignant lesions in clinical examinations, carrying out a biopsy procedure and its submission for histopathologic evaluation are associated with early diagnosis^{12,13,14}. In this study to determine the frequency of inconclusive histopathology reports in patients undergoing punch biopsy which are suspicious for malignancy and the factors involved that leads to inconclusive reporting, A total of 175 patients, age from 20-70 years, presenting with clinically frank malignant lesion of the oral cavity were included.

The oral cancer is thought to be a disease of old age group about 50 to 70 years but there are few published articles as per their results it can occur in quite younger age without the absence of any known risk factors^{14,15}. Most of the patients in our study were between 41-50 years and the average age of the patients was 47 ± 10.47 years. Oral cancer is one of the most common cancers in the world, with a marked variation in the geographical incidence. In India oral cancer is the number one malignancy amongst the males and the number three amongst the females^{15,16}. The Ahmedabad, Bangalore and the Bombay Cancer Registries show an annual incidence rate of 12.2, 4.32 and 7.8 per

100,000 for males and 3.94, 6.1 and 4.13 per 100,000 for females. This is in accordance to our study which shows a higher incidence is seen in case of males. In a review done by Nair et al.¹⁶, the prevalence of oral potentially malignant disorders and oral cancer was found to be more in males. In Karachi one would assume with some degree of certainty that the high incidence of oral cancer in males would be a result of tobacco chewing, betel quid chewing, cigarette smoking and synergism between these factors. The most common type of lesion was exophytic lesion that was observed in 99 (56.57%). However, the prevalence of oral potentially malignant disorders has a varied distribution globally as reported by various studies¹⁷. This may be attributed to difference in tobacco consumption and cultural, dietary, and environmental factors. In our study Buccal mucosa 36% and hard plate 21.7 were the commonest sites. Varied observations were shared by other authors. Mehrotra et al.¹⁸ reported (buccal mucosa and tongue 35.7% and 21.4%, respectively), M. Babshet et al.¹⁹ reported (buccal mucosa - 67%), Agarwal Munjal et al.²⁰ reported (tongue 39% and floor of mouth 28%). Frequency of inconclusive histopathology reports in patients underwent punch biopsy which are suspicious for malignancy was found to be 16 (9.14%) biopsy specimens in our study. Factor leading to inconclusive histopathology reports are less experience surgeon 93.78% (15/16), Tangential Cuts 56.3% (9/16) and superimposed fungal infection 43.8% (7/16). The traditionally recognized phases of laboratory work are the pre-analytic, analytic and post-analytic phases. Even though, all these phases are important in determining the quality and turnaround time of tissue biopsies in histopathology, the pre-analytic phase is arguably the most important. We found inexperience surgeon as most frequent factor 93.78% leading to inconclusive histopathology reports. The quality and quantity of biopsy taken by the surgeon determines the accuracy or otherwise of the report issued.²¹ In addition to this, other tissue handling variables also come into consideration in determining factors that influence the final outcome of tissue biopsies. These include Tangential Cuts, non-optimal fixation, improperly filled request forms and in correct specimen labeling among others^{22,23}. We found superimposed fungal infection 43.8% as a factor leading to inconclusive histopathology reports. This rate is found to be quiet high than reported in other studies. Spolidorio et al.²⁴ reported detection rate of 12.2% was found for fungal infection in oral mucosal biopsies using PAS stain. Similar studies were conducted by Barrett et al.²⁵ where a detection rate of 5% was found and Daftary et al.²⁶ who did PAS staining only for oral leukoplakia and found a detection rate of 6.8%.

CONCLUSION: We conclude that frequency of inconclusive histopathology reports in patients underwent punch biopsy was 9.1% and less experience surgeon was the most frequent factor leading to inconclusive diagnosis. The

consequences of inconclusive histopathology reports have included inability to render a diagnosis and sometimes negative clinical implications for patients. Patient may be subjected to unnecessary treatment with its attendant risk, wastage of resources, to repeated biopsies, avoidable mortality and morbidity as well as anxiety among the populace about the health-care delivery system as a whole.

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Oral Lugol's Iodine Is Effective In Controlling Thyroid Profile And Reducing Vascularity In Multinodular Goitre – A Case Report

Aiman Fatima Naqvi, Tariq Zahid Khan, Iqbal A. Muhammad Khyani

ABSTRACT : Multinodular goiter with hyperthyroidism in children is quite rare and may present with huge goiter, cardiac problems and increased per-operative bleeding. We present a case of seven years old female child having multinodular goiter with increased vascularity and fluctuating thyroid profile. It was controlled by oral lugol's iodine in a dose of 0.8 mg/kg once daily for 10 days. Total thyroidectomy was done with minimal per-operative bleeding. The literature is searched and case was discussed.

Key Words : Goiter, Hyperthyroidism, Lugol's iodine.

INTRODUCTION : The prevalence of hyperthyroidism in children varies between 0.5 and 2% of the world population¹. Graves' disease (GD) is the most common cause of hyperthyroidism in children and adolescents. It accounts for 10–15% of all childhood thyroid diseases². Hyperthyroidism is related with hemodynamic variations, including increased heart rate and cardiac contractility. It is reported that thyroid arterial blood flow correlated remarkably with the levels of free T3. Lugol's solution (inorganic iodide) has been given pre-operatively to patients to limit intra-operative bleeding and related complications resulting from thyroid gland vascularization. This effect transiently blocks thyroid hormone generation, with thyroid hormone synthesis recovering in a few days or weeks³.

CASE SUMMARY : A seven years old female child with no comorbidities admitted in ENT ward with chief complaints of huge swelling on neck for three years. She also complained of palpitations, heat intolerance, weight loss and fatigue for last three years for which she went to clinical practitioner who prescribed her anti-thyroid drugs based on her thyroid profile. Patient did not have any record of her thyroid profile. She was taking tablet Carbimazole 5mg once daily and beta blocker 10 mg once daily for last one year. On examination she was of thin built and height in accordance to her age. There was a huge swelling on neck which was moving on deglutition. It was of normal color, soft, non-tender, non-fluctuant, non-reducible. Trachea was central and there was no scar mark or discharging sinus. Temperature of swelling was significantly raised as compared to the body temperature with positive bruit. There was no exophthalmos, tremors or sweaty hands. Pulse was 140 beats per minutes. (Fig-1)

Routine lab investigations were unremarkable with normal Chest X-ray. Her thyroid profile showed serum TSH level of 2.14 Milli IU/ml (0.4-4 mIU/ml). Free T3 was raised to 5.9 Micro mol/l. Normal levels are upto 1.8-4.2 Micro mol/ml. Ultrasound showed both thyroid lobes and isthmus enlarged showing multiple complex solid and cystic nodule. Largest right lobe nodule measuring 5.1 x 3.8cm and largest left lobe nodule measuring



Figure1: Clinical photograph of the patient.

3.5 x 3.0cm with increased vascularity seen inside the nodule. Multiple micro calcifications also seen.

Colour Doppler showed marked vascularity. Computed tomography (CT) scan was not done as there was no retrosternal extension clinically and radiologically. TSH receptor antibodies (Thyroid stimulating immunoglobulins) were raised to 39.58 U/L. (Normal level < 1.0). Thyroid peroxidase antibodies were raised >1000 IU/ml. (Normal level < 35 IU/ml). Increase T3 causes increased vascularity of thyroid gland, consequently increased temperature and increased per operative bleeding. Indications were explored for giving oral administration of Lugol's iodine as advised by endocrinologist. Lugol's iodine was given to the patient according to weight which was 22 kgs. Dosage was calculated as 0.8mg/kg orally for 10 days. 1 drop of lugol's iodine contain 6.25mg therefore 3 drops contain 18.75 mg of lugol's iodine. It was mixed with a glass of milk or water. Free T3 was repeated after 2 weeks and it was within normal range (3.60 ng/ml). Patient then underwent total thyroidectomy. The surgery was uneventful with minimal per-operative bleeding due to drastic



Figure 2: Post-operative specimen.

reduction in vascularity.(Fig-2) Post operative recovery was uneventful and the patient was sent home on 5th post- operative day on tablet Thyroxine 100 mcg orally as post-operation thyroid level was 70 IU/ml. (Fig-3)

DISCUSSION: Hyperthyroidism is relatively rare in children (yearly incidence of 8 per 1,000,000 children less than 15 years old and 1 per 1,000,000 children less than 4 years old), but Grave's disease (GD) is by far the most common etiology⁴. GD is more common among females, with a peak incidence between 10 and 15 years of age. In pediatrics, Graves disease accounts for the majority of cases; however, less-common etiologies of hyperthyroidism, including genetic, infectious, or drug-induced (amiodarone induced) etiologies, may occur⁵. Hyperthyroidism is characterized by increased production of T3 and T4, with an increased T3:T4 ratio, a suppressed thyrotropin level and characteristic clinical symptoms. Graves' disease is thought to result from complex interactions between genetic and environmental factors and the immune system, although its pathogenesis remains unclear. The immune system of GD patients produces a thyroid-stimulating hormone receptor antibody (TRAb) that triggers the production of excess thyroid hormone by the thyroid gland⁶. The usual symptoms in children are due to increased adrenergic stimulation (palpitations, tremors) and behavioral changes (restlessness, irritability, poor sleep, declining academic performance). The other symptoms less commonly seen are anxiety, proptosis, excess appetite, weight loss and heat intolerance.⁷ Similar to adults, there are three modalities that can be employed in the treatment of pediatric Graves' disease: anti-thyroid medications, radioactive iodine ablation or thyroidectomy.⁸ The common anti thyroid agents that are used are Methimazole (MMI), Carbimazole, and Propylthiouracil (PTU). These agents primarily act by inhibiting thyroid hormone synthesis by inhibiting thyroid peroxidase mediated iodination



Figure 3: Post-operative specimen.

of tyrosine residues in the thyroglobulin. The recommended starting dose is 0.5–1.0 mg/kg/day for Methimazole and 5–10 mg/kg/day for Propylthiouracil⁹. Based on current guidelines, thyroidectomy is the preferred treatment in children younger than 5 years of age when definitive therapy is required and in children with large goiters who experience major adverse effects to anti-thyroid drugs because the response to I131 may be poor in these cases. If surgery is planned, the patient should be pretreated with beta-blockers and anti-thyroid drugs or inorganic iodine. Use of inorganic iodine for 7 to 10 days reduces the vascularity of a large goiter and is particularly important when anti-thyroid drugs cannot be used because of their adverse effects. Lugol's solution (inorganic iodine) has been given pre-operatively to patients to limit intra-operative bleeding related complications resulting from thyroid gland vascularization. It is commonly used in the preparation of patients for thyroidectomy. This effect transiently blocks thyroid hormone generation with thyroid hormone synthesis recovering in a few days or weeks. Near-total or total thyroidectomy is the recommended procedure for management of Graves' disease¹⁰.

CONCLUSION : Lugol's iodine is effective in controlling thyroid profile and to reduce the vascularity of multinodular goiter with hyperthyroidism resulting in less risk of cardiac problem and per-operative bleeding.

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Unusual Presentation of Parathyroid Adenoma: A Case Report

Hira Zaidi, Iqbal A. M Khyani, Murtaza Ahsan Ansari, Sadaf Zia

ABSTRACT : Primary hyperparathyroidism is identified by Van Recklinghausen. Primary hyperparathyroidism is diagnosed as an incidental finding of hypercalcemia in routine blood tests or sometimes due to symptoms secondary to hypercalcemia. Overt bone disease is an extremely rare complication of primary hyperparathyroidism. Fractures that occur because of elevated parathyroid hormone are unusual and usually affect the vertebrae. We report a case of benign parathyroid adenoma who primarily presented in orthopaedic clinic with pathological fracture of tibia. Patient underwent surgical exploration, focused on parathyroid gland, excision brought the normal biochemistry profile. To our knowledge, there is no reported clinical case of xanthoma arising in association with parathyroid adenoma.

Key Words : Parathyroid adenoma, tibial fracture, bone xanthoma

INTRODUCTION : Parathyroid adenoma is the common cause of primary hyperparathyroidism and usually present with features of hypercalcemia¹. In 80-85% cases, primary hyperparathyroidism is due to parathyroid adenoma, 10-15% parathyroid hyperplasia and rarely less than 1% carcinoma^[1]. Parathyroid adenoma is a benign neoplasm commonly involve single gland, but can also involve multiple glands. Pathological fractures seen in hyperparathyroidism can be associated with classical skeletal complication of hyperparathyroidism called brown tumor or osteitis fibrosa cystica, occur in 2% of patients diagnosed with hyperparathyroidism¹. Patient with primary hyperparathyroidism with increase serum calcium levels may present such as fatigue, pain, weakness, polyuria, polydipsia, muscle weakness, particularly in the proximal extremity muscles, gastrointestinal upsets and nephrolithiasis². More than 50% of patients with hyperparathyroidism have renal symptoms manifested by nephrolithiasis and nephrocalcinosis⁵. Various degrees of depression, nervousness, and cognitive dysfunction may commonly occur in pHPT⁸. Extreme calcium levels can lead to cardiac arrhythmias, coma and death³. Sonography and 99mTc – sestamibi scintigraphy are the primary imaging modalities utilized for the visualization of diseased glands³. 99mTc nuclear scan is highly specific for abnormal parathyroid tissue, and its sensitivity is more than 90% in solitary adenoma⁷.

CASE SUMMARY : A 30 year old female presented to ENT OPD at Dow university hospital with no known co-morbidities referred from orthopaedic clinic where she was presented with complain of generalized lassitude, unable to walk, swelling and bone pain in left lower leg, following slip and fall. X-ray of tibia shows lytic lesion on proximal part of bone with break in cortex (Fig 1).



Figure1: X-ray showed osteolytic lesion of proximal tibia showed pathological fracture.

Biopsy was performed at orthopaedic department, histological report showed extensive cholesterol clefts surrounded by giant cells mixed with foamy histiocytes favour Xanthoma of bone. No evidence of malignancy. Laboratory data revealed elevated calcium (15.26 mg/dl), decrease phosphorus (1.3mg/dl), elevated ALP (202 U/l), elevated PTH (681.1 pg/ml). Rest of blood test was in normal range. There was no other significant family or personal history. Examination revealed a young female, looked anxious, vitally stable. Ear and nose examination were unremarkable. There was no swelling found on palpation of neck. The remaining physical examination was within normal limits. Ultrasound imaging of neck showed right parathyroid adenoma and normal thyroid gland. 99mTc-MiBi scintigraphy showed increase uptake in the region of right parathyroid gland. These findings are likely due to parathyroid adenoma (Fig 2). The ultrasound KUB showed

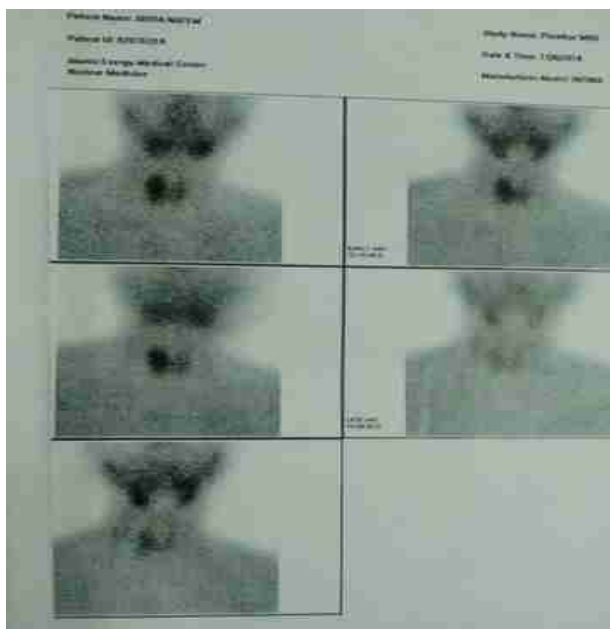


Figure 2: Tc-99 sestamibi parathyroid scan showing increase uptake in right parathyroid gland.

increase parenchymal echogenicity is noted bilaterally could be indicative of renal parenchymal disease. No obstructing calculus on either side. The electrocardiogram was within normal limits. Bone survey reveals cystic masses and evidence of demineralization. With preoperative diagnosis of parathyroid adenoma patient was initially managed for biochemical correction of calcium level with adequate hydration. After correction of serum calcium level and localization of parathyroid adenoma, surgery was planned for focused exploration. An exploration of parathyroid adenoma was done. The tumor was excised in toto. Postoperatively the immediate response noted was decrease of calcium levels from 15.26 mg/dl to 9.1 mg/dl. Level of parathyroid hormone decreased to normal range from 681.1 pg/ml to 77 pg/ml (Normal range 16-87 pg/ml). After excision specimen was sent for histopathology which showed well circumscribed lesion with thin capsule composed of proliferation of round cells some arranged in tubules. No nuclear atypia and mitosis seen (fig 3)

DISCUSSION : Primary hyperparathyroidism is due to adenoma of the parathyroid gland in 85% of cases, the remainder is due to multiple adenomas and parathyroid cancers in order of decreasing frequency¹. Normal parathyroid gland are too small and difficult to palpate. 50-70% of parathyroid adenoma discovered when a higher than normal calcium level incidentally found on a routine blood test then confirm the diagnosis of primary hyperparathyroidism². Up to 1/3 of people with primary hyperparathyroidism have no symptoms². When symptoms appear they are often mild and nonspecific such as muscle weakness, fatigue, increase need for sleep, feelings of depression, aches and pains in bones and joints. These symptoms are mainly due to increase



Figure 2: Tc-99 sestamibi parathyroid scan showing increase uptake in right parathyroid gland.

calcium that result from excessive parathyroid hormone. There are number of studies which have confirmed that there is increased risk of fractures in patient with hyperparathyroidism and reduced risk who undergo surgical exploration of parathyroid gland. Pathological fractures in hyperparathyroidism are rare and usually affect the vertebrae. Extensive bony involvement with pathological fractures as a presenting feature due to parathyroid carcinoma has been documented, but pathological fractures, as a presenting feature of primary hyperparathyroidism due to parathyroid adenoma is extremely rare⁶. T99m nuclear scan is highly specific for abnormal parathyroid tissue, and its sensitivity is more than 90% in solitary adenoma, but in multiple glands involvement, its sensitivity is very low (55%). Combination of ultrasound and computed Tomography (CT) has incremental value in accurately localizing solitary parathyroid adenomas over either technique alone. Ultrasonography, CT scans, and Magnetic Resonance Imaging (MRI) all have been used for localization, but they have been replaced largely with 99mTc-sestamibi⁷.

Our patient had a history of fall and considering her age, osteoporosis was less likely. Though no correlation was identified between risk of pathological fracture and preoperative calcium level. Generally pathological fractures have been described in patients with parathyroid carcinoma. Usually pathological fractures can be due to brown tumors which is a rare complication of primary hyperparathyroidism⁴. Thus in young female, pathological fracture is highly suspicious of parathyroid disease. A combination of biochemical and radiological tests will help in diagnosis of primary hyperparathyroidism. There are number of studies which have confirmed that there is

increased risk of fractures in patient with hyperparathyroidism and reduced risk who undergo surgical exploration of parathyroid gland^{6,7,9}. Although, offering parathyroidectomy to all patients with primary hyperparathyroidism, regardless of age, calcium level, bone mineral density and other variables may have good benefits, but it should be considered very carefully in patients older age⁹. A recent study emphasizes the importance of early parathyroidectomy, demonstrating that parathyroidectomy is cost-saving compared to observation and serial monitoring of patients with primary hyperparathyroidism⁷. Bone Xanthoma is a very rare lytic lesion of bone which may result from abnormal deposition of cholesterol and lipid into tissues leading to inflammatory cell infiltration, whose prognosis is good¹⁰. Their definitive diagnosis is very difficult because of its features mimicking other benign and metastatic bony lesions. Most reported cases of hyperparathyroidism from parathyroid adenoma are reported with brown tumor of bone. In view of the rare presentation of xanthoma of bone with hyperparathyroidism from parathyroid adenoma, our case is unique and hence this is being presented. It is concluded that etiological association of hyperparathyroidism with xanthoma of bone is not appropriate from one case, but the possibility of relationship can't be totally excluded.

CONCLUSION: The extensive skeletal involvement due to hyperparathyroidism has rarely been reported. The substantial improvement in bone density, in promotion of fracture healing and in preventing pathological fractures after successful parathyroid adenectomy. In conclusion, a high index of suspicion is necessary to diagnose this unusual presentation of primary hyperparathyroidism. A pathological fracture in young lady with marked osteopenia is highly suggestive. A combination of biochemical tests, including serum levels of calcium, phosphorus, alkaline phosphatase and parathormone assay will help in diagnosing primary hyperparathyroidism in 90% of the cases. All patients with Primary Hyperparathyroidism

should have Vitamin D level assessment in order to exclude the coexistence of Vitamin D deficiency with Primary Hyperparathyroidism. High Resolution Ultrasound Scan of neck provides valuable preoperative information in selected cases especially in those undergoing minimally invasive parathyroid surgery. Surgical excision and calcium supplementation along with external or internal splinting of fractures allowed the fractures to heal⁶.

CONSENT: Consent was obtained from the patient for the publication of this report and any accompanying images

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