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Dentistry and Otolaryngology

Choanal Polyps of Unusual

Self Inflicted Cut Throat Injury

Highlights

Characteristics of Alveolar

Knowledge, Attitude & Practices

Discovering Thoughts, Inventing Future

VOLUME 15 ISSUE 2 VERSION 1.0

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Characteristics of Alveolar Inter-Cortical Osteotomy Technique on the Maxilla

By Ananian S.G., Zakaryan A.V., Gunko M.V. & Gvetadze S.R.
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Abstract- Main statements of inter-cortical osteotomy technique of the alveolar crest with its horizontal atrophy are envisioned. Criteria for patient selection for the technique utilization are presented. Some aspect of prophylaxis against postoperative adverse effects and complications are discussed.

Keywords: alveolar crest splitting, vestibular advance-ment of the cortical plate, dental implant, osteoplastic material.

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Characteristics of Alveolar Inter-Cortical Osteotomy Technique on the Maxilla

Ananian S.G. [α], Zakaryan A.V. [σ], Gunko M.V. [ρ] & Gvetadze S.R. [ω]

Abstract- Main statements of inter-cortical osteotomy technique of the alveolar crest with its horizontal atrophy are envisioned. Criteria for patient selection for the technique utilization are presented. Some aspect of prophylaxis against postoperative adverse effects and complications are discussed.

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I. Introduction

Among various techniques of atrophied alveolar crest augmentation, currently a particular place is occupied by transversal expansion obtained by corticotomies and vestibular advancement of the outer cortical plate in the edentulous region [1, 2, 3, 4, 5, 6].

Its advantages in acquiring long-term results in the field of dental implantation are described in numerous publications [7, 8, 9, 10]. Though it is reported about potential difficulties associated with attaining a primary stability of the dental implantand the optimal thickness of the covering soft tissues or the so-called biological width of the adjacent gingiva, which assumes an existence of a zone (surface) of connective and epithelial tissues attachments to the coronal part of the bony crest [11, 12, 13]. Controversial are the opinions about the structure of the dissected flap which is most favorable for the blood supply of the osteotomized fragment [13, 14], and the rationales for immediate soft-tissue deficit management [15, 16, 17].

In this paper the surgical stages of the alveolar inter-cortical osteotomy (AICO) are presented as well as patient selection principles and aspects of postoperative complications prophylaxis.

After local anesthesia is introduced the operation begins with a development of a compound flap (caudally a full-thickness and cranially – split-thickness) on the outer aspect of the alveolar crest in the site of the future implant placement, after that the inter-cortical osteotomy is utilized for providing the vestibular advancement of the outer cortical plate of alveolar thickness augmentation.

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Incision and soft tissue stripping

A linear horizontal incision is made:

- within the keratinized fixed gingiva;
- on the top or the palatal cranial margin of the crest in the gap between the two neighboring teeth or the two purposed vertical incisions (if the site is edentulous);
- to the bone with the cutting of the periosteum;
- at the gingival papillae of the adjacent teeth the incisions should be performed in intrasulcal and marginal fashion with the gingival margin of the dental crown should be left intact (Fig. 1).

Technical note: an important condition in incision design is to avoid the coincidence of the osteotomy and the suture lines, this decreases the possibility of wound dehiscence and infection.

The dissection of the compound flap begins with dismantling of the bony alveolar crest in the extent of 3-4 mm on the vestibular (slightly beyond the muco-gingival junction) and palatal sides, as well as at the projection of the adjacent teeth. At this stage the coronal part of the vestibular flap containing the periosteum is established (Fig. 2). Next the periosteum is cut and the muscular attachments are divided along the whole length of the flap, the tip of the blade should permeate the wound for no more than 2 mm in the direction parallel to the surface of the bone (this is done to elude the undesired perforation of the mucous membrane which is particularly thin in these locations). Further flap elevation is performed: with sharp dissection; over the periosteum, i.e. in the submucous layer; to the level of the upper vestibule holding the scalpel parallel to the mobile mucous membrane. The larger apical part of the compound flap has the split-thickness surface approximately 6-7 mm wide. By keeping the periosteum intact the blood supply of the bone is preserved and the flap mobility is increased, this also helps to avoid placing the verticalmucosal releasing incisions, which is favorable for the trophism of the local soft tissues (Fig. 3).

If augmentation of the fixed gingiva (in cases where its thickness is >2 mm) and/or correction of gingival recession is desired, a bilaminar technique, described by Zucchelli G. (2013) may be utilized. In this technique a coronal advancement of the vestibular flap in conjunction with a free connective tissue graft is employed [18].

Augmentation of the width of a narrow edentulous alveolar crest in the maxillary frontal region it should be considered that its external contour is concave, which is an uncomplimentary factor for achieving aesthetically pleasing results. Reconstruction of the convex shape of the maxillary front is executed as follows: immediately after the horizontal opening is made to the depth of 8-10 mm a wedge-shaped chisel is used to widen the intra-bony gap for about 2 mm. Then, at the site of the planned implant placement the future implant bed is drilled using a 2.0 mm drill, the opening is steadily widened in buccal-lingual directions with special expanders. Consecutively applyingthe expanders with increasing diameter induces surrounding marrowcompression, relocation and "straightening" of the outer cortical plate. Next vertically orientated osteotomies are performed in the described fashion via the intra-bony access. Besides, another particularity of surgery in the maxillary frontal region is that the implant's neck must be buried 3 mm deeper to the cement-enamel junction which, in turn, corresponds to the biological width of the gingiva. This is set up from three anatomic elements of the gingiva: the gingival sulcus, and the zones of epithelial and connective tissue attachments.

Inter-cortical osteotomy starts with a horizontal saw cut in the middle of the top of the bony alveolar crest, after that two additional cut are placed on its medial and lateral ends. The splitting if the crest within the bonycuts is achieved by vestibular advancement of the outer cortical plate after a sub-periosteal fracture at its base (Fig. 4). For successful horizontal cut one must establish the following: a) to minimize bony loss during splitting by using sophisticated instruments (piezo-surgery, diamond discs, fine sharp chisels etc.); b) osteotomy of the crest must be performed to the marrow and somewhat in an external direction for securing the vestibular plate's thickness of 2 – 2.5 mm; c) all bony cuts are made beyond the distance of ≥ 2 mm from the adjacent tooth roots.

Vertical releasing saw cuts of the cortex (Fig. 5) are done as follows: a) with a piezo-surgery instrument or a fissure carbide bur placed intra-bony by its gradual translocation vestibulary; b) perpendicular to the horizontal cut (on both ends of the horizontal cut) starting from the top of the crestapproximately for 8-10 mm caudally; c) beyond at least 2 mm to the periodontal ligaments of the adjacent teeth; d) special care must be taken not to injury the overlying periosteum.

Osteotomy is finished with a thin acicular chisel which is introduced into the opening between the inner and outer cortical plates developed by the horizontal cut. Achieved such an intra-bony position the chisel is advanced vestibulary from the basal aspect of the crest and at the base of the osteotomiezed fragment a fracture is developed (a "green stick" fracture) and relocated on its periosteal pedicle. The control for this relocation is achieved by putting the index finger on the surface of the vestibular cortical plate. The palatal cortical plate should be kept intact (Fig. 6).

At this point the developed defect is assessed to define if an immediate or delayed implantation can be performed. Depending on the degree of stability of the relocated vestibular plate on its periosteal pedicle implant placement may be immediate or delayed. An obligate for immediate implantation is that the thickness of the bony walls after splitting should remain ≥ 2 mm, otherwise a delayed implant placement is recommended. In the two-stage treatment protocol the defect is filled with osteoplastic material and implantation is performed at the second stage after achieving bone regeneration. Utilization of the osteoplastic material helps prevent the returning of the splintered cortical plates. Small openings 1 – 3 mm wide usually are filled without adding bone wedges. In immediate implant placement the osteoplastic material is mixed with the bone chips which were gained during the operation. For improving the stability of the augmented site a barrier collagen membrane is used.

Implant bed development and implant placement
Immediate implant placement may be undertaken only if a proper stability of the relocated vestibular plate has been achieved. After finishing the inter-cortical osteotomy the guiding openingsat the level of the crest's base are drilled with 2 – 2,5 mm diameter drills, depending on the implant system. While forming the bed attention must be taken to minimize the vestibular plate's injury by: a) keeping some marrow attached to it; b) the osteotomy for the bed directed palatally (according to the dento-alveolararch and occlusion); c) accurate implant insertion (Fig. 7). There are two obligate factors for achieving primary stability of the implant in the lateral maxillary region. The implant should be covered by bone at least for two thirds of its length and must be located 0,5 – 1 mm lower to the free coronal margin of the alveolar crest. For this reason the mobile vestibular plate may be additionally fixed to the palatal cortical plate with micro-screws. To prevent mucosa ingrowth the cappingis installed.

If delayed implantation is planned the surgically created cleft between the two cortical plates is filled with osteoinductive and /or osteoconductive material which is left for healing for 4 – 6 months. For osteoplastic purposes the autogenous bone chips are combined with xenogenic material. The augmented site may be in certain cases covered with a barrier membrane, which is placed under the muco-periosteal flap and covering all the exposed osteoplastic material (Fig. 8).

II. Wound Closure

After completing the augmentation or the implant installation the flap is moved caudally and

without tension sutured to the wound margin with fine thread (5/0 or 6/0 diameter). At this stage the rebasing of the dentures is made to prevent the denture's contacts with the wound (Fig. 9).

Patients should avoid using the removable dentures before sutures are kept (usually for 10-14 days postoperatively). Later on the dentures must be corrected not press on the surgery site.

III. Criteria for Patient Selection, Advantages and Disadvantages of AICO

The main indication for AICO is the existence of an edentulous site which possesses the following conditions:

1) moderate atrophy of the residual crest in the horizontal plane*,IV class of Cawood and Howell classification (1988) [19] (to obviate small bone chips scabbing during osteotomy);
2) sufficient vertical dimensions of the residual crest to assure the choice of optimal length of the implant;
3) bone density of D2 – D4 according to Misch **[20];
4) the presence of some marrow between the outer and inner cortical plates.

Considering the possibility of damaginglocal tissue perfusion the procedure should planned in a limited zone, within 1-3 absent teeth, which approves the mobilization of a relative small fragment of bone. Depending on the thickness of the alveolar crest the one-staged or two-staged surgery is performed.

*Minimal preoperative thickness of the apical part of the alveolar crest in cases of delayed implant placement must be no less 3 mm, because for resorption prophylaxis the minimal thickness of the outer cortical plate of the developed intra-bony gap must comprise at least 2 mm.

**In this type of bone density alveolar splitting often can be performed with expanders only without vertical saw cuts.

Indications for delayed implant placement

- Not possible to ensure the conditions for primary stabilization of the dental implant;
- the thickness of the vestibular cortical plate after splitting is no less than 1,5 – 2 mm (the significant horizontal resorption of the crest may be noticed consequently to the paradontal pathology, tooth extraction and vestibulary directed teeth roots);
- insufficient volume of soft tissue available for surgical defect coverage;
- residual inflammatory process at the apex of the previously extracted tooth.

Delayed implant placement is performed after 4 – 6 months after the first operation.

Indications for immediate implant placement

- Sufficient height of residual bone (no less than 8 – 10 mm);
- enough bone in the basal part of the crest;
- the alveolar width within 4 – 5 mm;
- primary mechanical stabilization of the advanced vestibular cortical plate.

In the lateral maxillary region if vertical dimensions of the alveolar crest are no less than 5 mm AICO can be combined by a sinus-lift with a window creation and antral floor augmentation and dental implant placement. This protocol is not utilized if the implant can not be optimally positioned in the palatal bony wall and/or the primary stability of the implant is unattainable.

Hence, AICOwith or without the use of osteoplastic material is performed for augmentation the thickness of an edentulous site of the alveolar crest to develop the conditions for dental implant placement.

IV. Contra-Indications

Utilization of AICO technique is unsuitable in the following conditions: a) vertical crest augmentation at the certain site; b) no marrow between the two cortical plates at the site; c) excessive horizontal atrophy of the crest (thickness less than 3 mm), as it may be a cause of improper implant positioning resulting in difficulties during the prosthetic stage; d) signs of maxillary sinus infection.

Advantages and limitations of AICO technique

1. In most cases it helps to achieve widening (for 2 – 5 mm) of a narrow alveolar crest without a need for bone block grafting;
2. The following conditions are accomplished: a) for immediate implant placement (without clinical contra-indications); b) proper osseous regeneration, stable fixation and osseointegration of the installed implant; c) optimal positioning of the dental implant (in the view of future functional loading);
3. High aesthetic result is executed by: a) significant outer advancement of the vestibular cortical plate, possibility for an implant with larger diameter to be installed, new bone formation at the site of implantation and selective modeling of soft tissues; b) immediate increase of keratinized gingiva volume, muco-gingival junction line restoration, and creation of natural soft tissue profile around the neck of the implant and at the site of gingival papillae (if a connective tissue transplant is used);
4. Comparatively little time needed for osseous wound healing (usually take no more 4-6 months);
5. In the two-staged protocol AICO can be combined with a sinus-lift, because outer cortical plate advancement does not lead to significant deterioration of the blood supply to the bone.

The main disadvantage is that only horizontal dimensions can be augmented. Clinicians should also be aware of possible risk associated with technical details of the operation the dislocated bony fragment may experience resorption, in case of complete reattachment of the covering muco-periosteal flap.

Altogether, the use of the compound flap described in cases that allow larger apical parts of the vestibular cortical plate to be attached to periosteum allows to expand the indications for AICO, it means that immediate implant placement is possible if the cortical bony plates possess the thickness of 1 – 1,5 mm. But as far as a durable result is desired one must be sure the gingival thickness is no less 2 mm. Technical difficulty of the surgical interference is among the disadvantages of the method. The most difficult point is the dissection of the compound flap because in the zone of the mobile mucous membrane a risk exists to perforate it. Performance of the three saw cuts with consequent inter-cortical osteotomy is a tedious procedure, especially in cases of incorporated single tooth defects in the lateral mandibular region (because of the alveolar crest inclination and limited space for instrument usage). It is also worth to recommend that magnifying technique (binoculars or a an operating microscope) should be used during 6/0 thickness suture placement.

It must be accepted that for a certain group of patients the alveolar inter-cortical osteotomy is the most realistic treatment option which effectively can lead to optimal results. Deep knowledge of the anatomical relationships of bony and soft tissue structures, and analyzing clinical and radiographic details help to decrease the risks of unforeseen technical difficulties and undesired side effects in the postoperative period.

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Figures

Figure 1 : Incision along the crest and dismantling the vestibular surface of its coronal aspect.

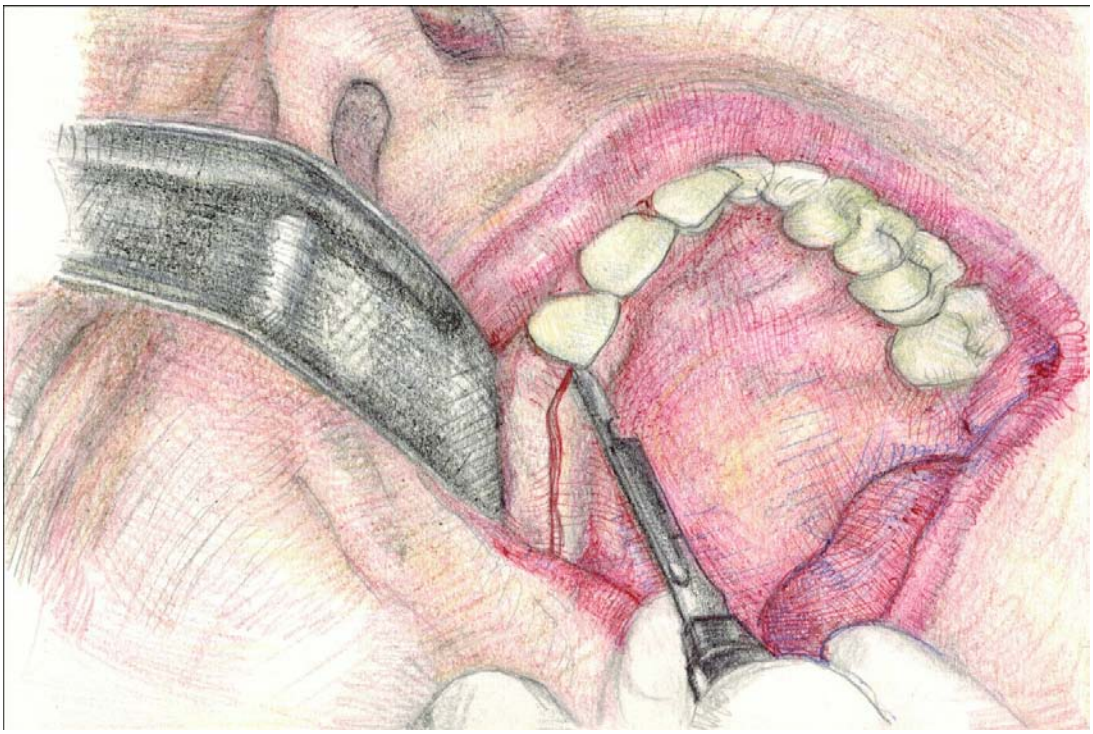

Figure 2 : The compound flap is designed with the muco-periosteum contained in its upper part and split-thickness in the apical part.

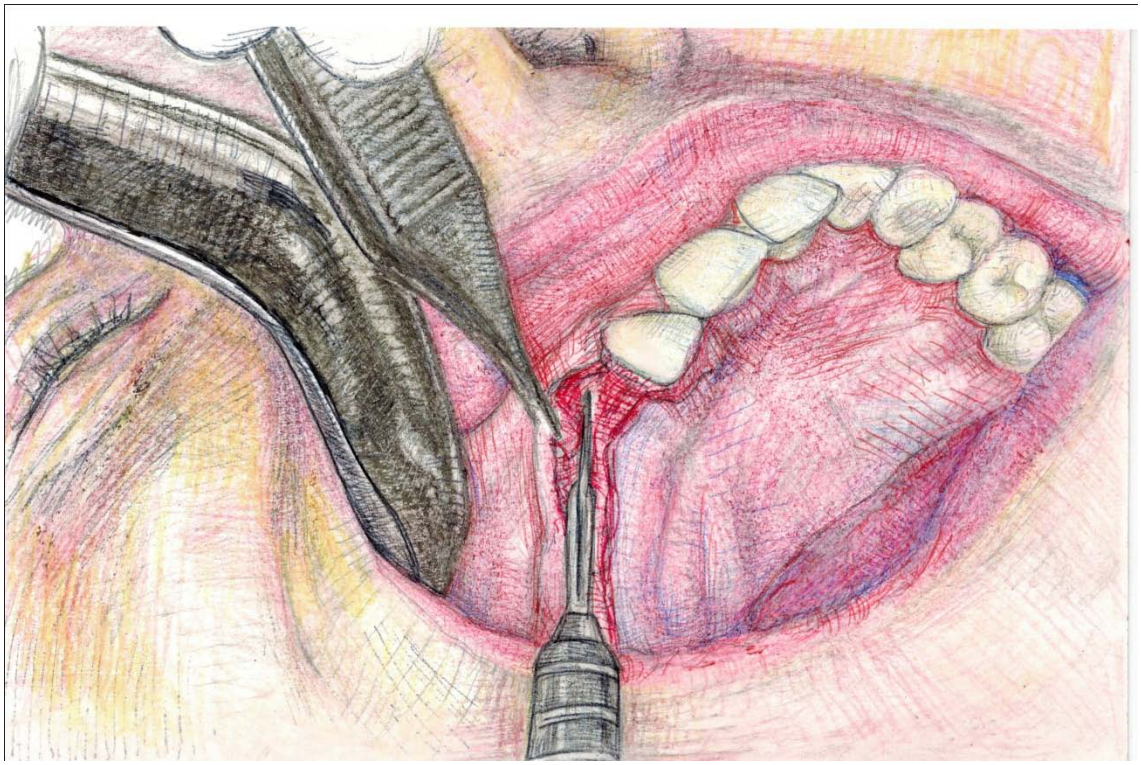

Figure 3 : Flap mobilization with linear periosteum hacking.

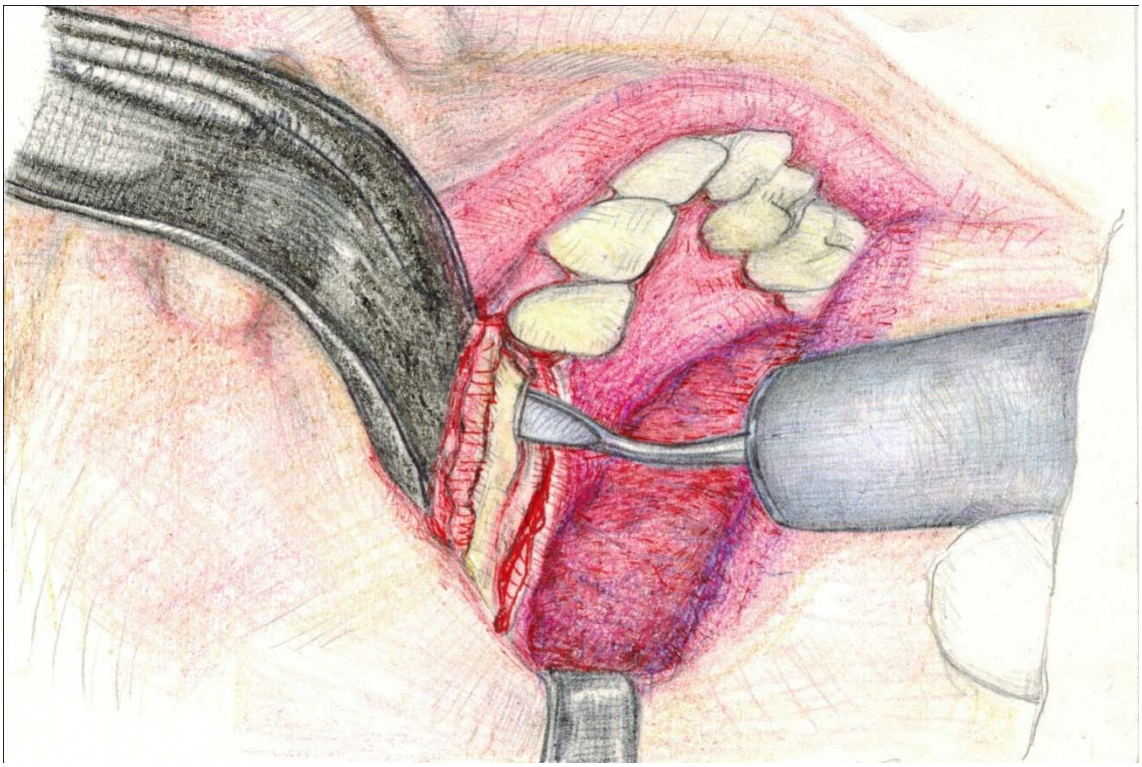

Figure 4 : Horizontal midcrestal saw cut performed with piezo-scalpel.

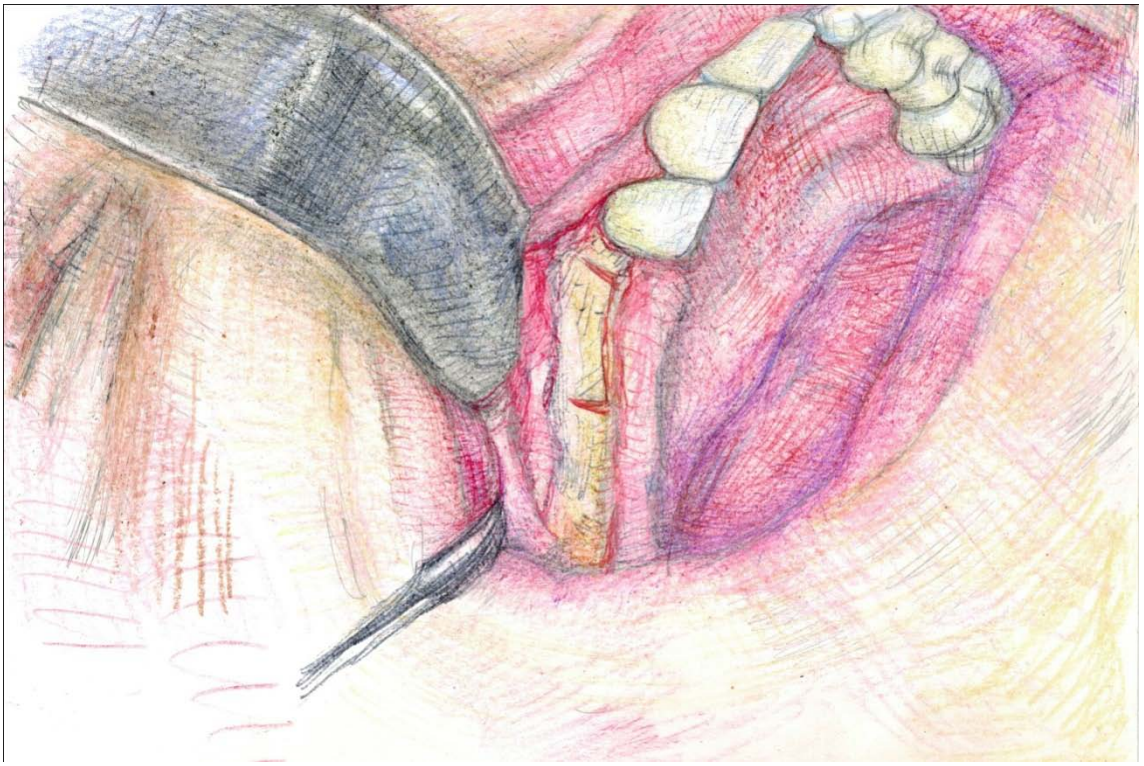

Figure 5 : Vertical bone cuts through the cortical layer.

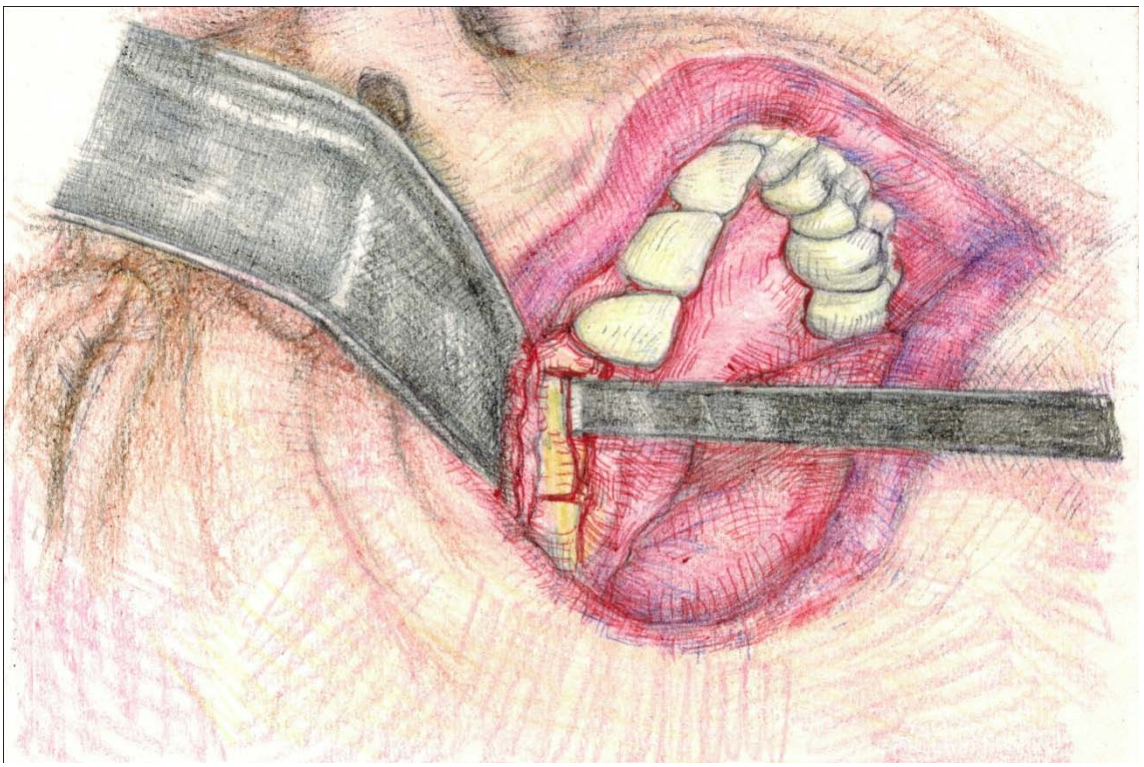

Figure 6 : Fine chisel is introduced in the saw cat for executing the final stage of the osteotomy.

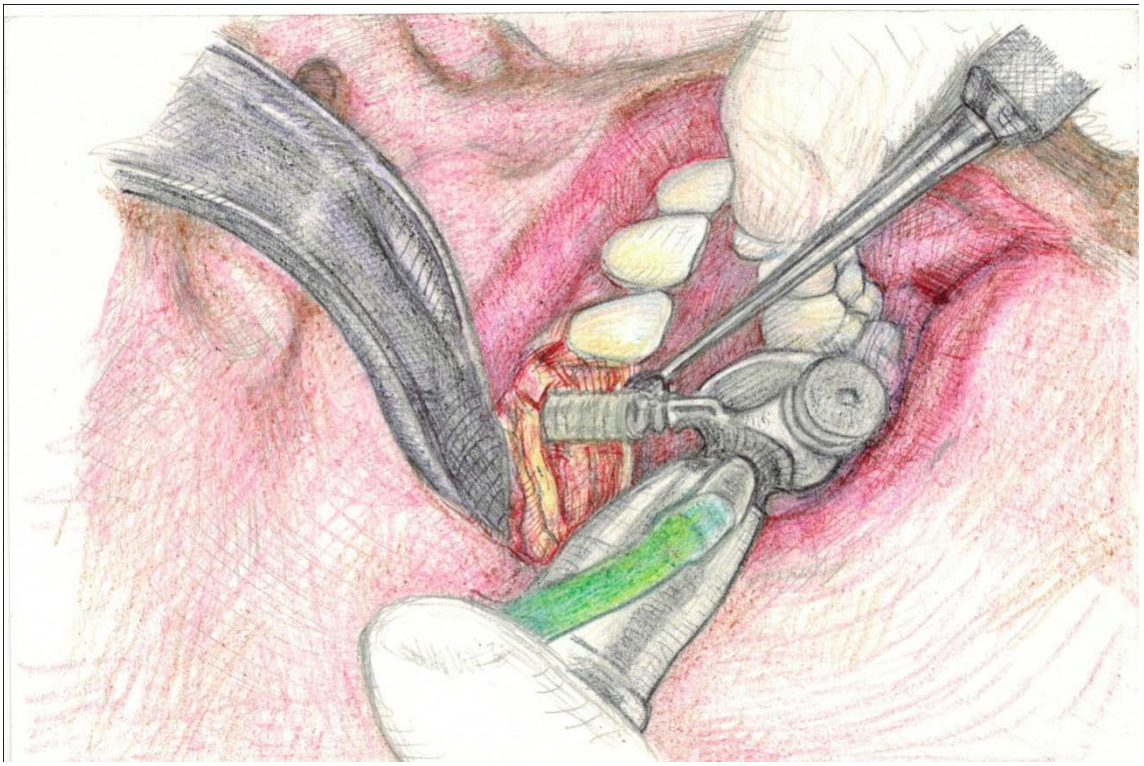

Figure 7 : Dental implant placement.

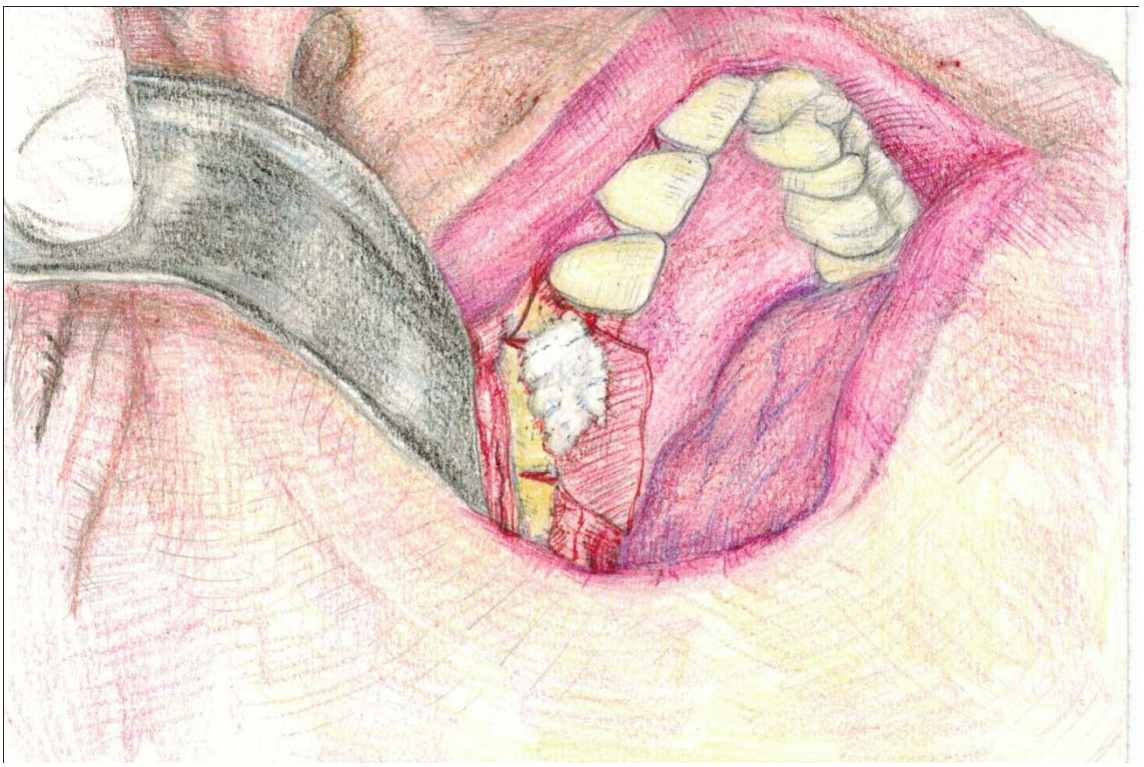

Figure 8 : Bone deficiency is addressed by filling with osteoplastic material, a bioresorbing barrier membrane is arranged.

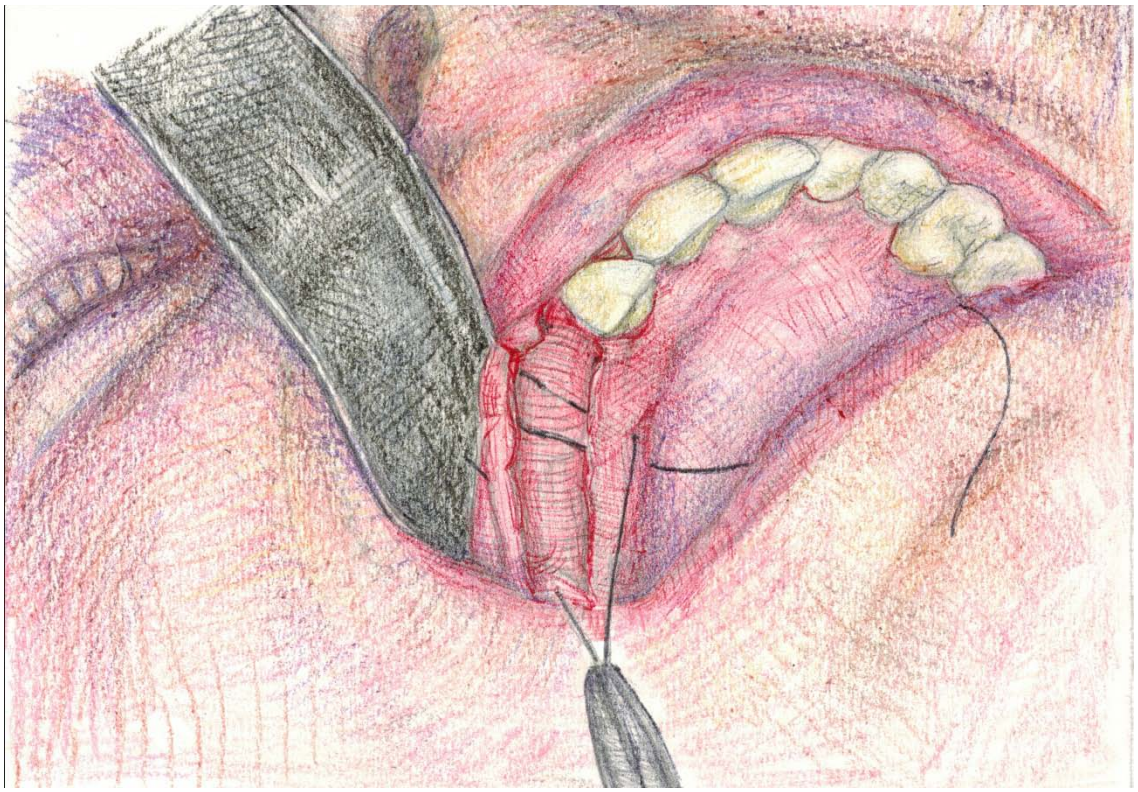

Figure 9 : Wound closure.

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Choanal Polyps of Unusual Presentation – A Series of 4 Cases

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Abstract- Choanal polyps are the solitary benign tumours that originate from the sinus or nasal mucosa projecting into the nasal cavity, choana and even up to the oropharynx. The exact aetiology of choanal polyps is unknown. Several theories have been formulated in the past years to describe the aetiology of choanal polyps. It is more commonly seen in young age patients. In young patients with a history of unilateral progressive nasal obstruction, it is always necessary to rule out choanal polyp. Although antrochoanal polyps are the most common, it is not a rule. Choanal polyp can also originate from sphenoid sinus and ethmoidal sinus, nasal septum and lateral wall of nose. Rare cases of these presentations are also reported. Endoscopy assisted surgery is the treatment of choice. Endoscopy can also be used as a diagnostic guide when CT scan findings are inconclusive in differentiating antrochoanal and sphenochoanal polyp. One must also keep in mind the other possible differential diagnosis.

GJMR-J Classification: *NLMC Code: WI 430*

CHOANALPOLYPSOFUNUSUALPRESENTATIONASERIESOF4CASES

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Choanal Polyps of Unusual Presentation – A Series of 4 Cases

Ajay Manickam [α], Shaswati Sengupta [σ], Debangshu Ghosh [ρ], Sebananda Haldar [ω], Jayanta saha [¥], SK Basu [§] & Souradeep Ray [χ]

Abstract- Choanal polyps are the solitary benign tumours that originate from the sinus or nasal mucosa projecting into the nasal cavity, choana and even up to the oropharynx. The exact aetiology of choanal polyps is unknown. Several theories have been formulated in the past years to describe the aetiology of choanal polyps. It is more commonly seen in young age patients. In young patients with a history of unilateral progressive nasal obstruction, it is always necessary to rule out choanal polyp. Although antrochoanal polyps are the most common, it is not a rule. Choanal polyp can also originate from sphenoid sinus and ethmoidal sinus, nasal septum and lateral wall of nose. Rare cases of these presentations are also reported. Endoscopy assisted surgery is the treatment of choice. Endoscopy can also be used as a diagnostic guide when CT scan findings are inconclusive in differentiating antrochoanal and sphenochoanal polyp. One must also keep in mind the other possible differential diagnosis.

I. Introduction

Choanal polyps are the solitary benign tumours that originate from the sinus or nasal mucosa projecting into the nasal cavity, choana and even up to the oropharynx. Most common presentation is choanal polyp originating from maxillary antrum[1]. Sphenochoanal, ethmoidochoanal, septochoanal polyps are uncommon. The exact aetiology of choanal polyps is unknown. Several theories have been formulated in the past years to describe the aetiology of choanal polyps. It is more commonly seen in young age patients. When a young patient is presenting with complaints of unilateral nasal obstructionor hawking sensation we should have a high suspicion about Sino nasal polyposis. Diagnostic nasal endoscopy (DNE) and radiological study should be carried out followed by endoscopic sinus surgery forms the protocol of management for choanal polyps.

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II. Aims and Objectives

To identify and study about choanal polyps of unusual origin and their management and to review with relevant available literature and studies.

III. Materials and Methods

To record all patients presenting to the department of ENT RG Kar Medical college hospital with different types of nasal polyposis from 1/08/2013 to 1/06/2014 and taking into consideration, confirmed cases of choanal polyposis of unusual presentations. Cases of usual presentations like AFRS, pan polyposis, bilateral ethmoidal polyposis were excluded from the study. After taking the informed consent, history and clinical findings were recorded and diagnostic nasal endoscopy and CT scan of nose and PNS were done. Pre-operative and post-operative endoscopy was done and recorded for future follow up and further study. All surgically excised polypoidal mass were send for histopathological examination. After surgery patients were discharged from ward on day 5, and were regularly followed up after 15 days, 1 month, 3 months, 6 months and 1 year.

IV. Results

One among the 4 patients in the study was female and other 3 were male. Age limit of the patients were from 17 years to 38 years. Nasal obstruction was the most common complaint in all the 5 patients. In all patients diagnostic nasal endoscopy and CT scan were done. The most common clinical presentation in all patients was nasal obstruction followed by hawking sensation, anosmia and mouth breathing. The clinical presentation with relevant history, management and follow up illustrated in table 1.

Table 1 : Grand chart

S.No	Age/ Sex	Clinical presentation	DNE	CT Scan	Surgical procedure	Histopathological study	Follow up
Case 1	27/ M	Nasal obstruction Mouth breathing	Polypoidal mass arising from nasal septum	Septochoanal polyp	Endoscopy assisted polypectomy with excision of mucoperiosteal layer	Nasal part was polypoidal, choanal part was rhinosporidiosis (dual pathology)	15 days, 3months, 6 months, 1 year – no recurrence
Case 2	23/M	Nasal obstruction	Polypoidal mass arising from the inferior turbinate	Polypoidal mass from the lateral wall of nose filling the choana	Endoscopy assisted polyp excision with cauterization of stalk	Nasal inflammatory polyposis	15 days, 3months, 6 months, 1 year – no recurrence
Case 3	38/F	Hawking sensation Epistaxis 1 episode	Polypoidal mass from the septum entering into choana	Polypoidal irregular mass filling the choana	Endoscopy assisted polypectomy with excision of mucoperiosteal layer	Respiratory epithelial hamartoma	15 days, 3months, 6 months, 1 year – no recurrence
Case 4	17/M	Nasal obstruction, hawking sensation, mouth breathing	Polypoidal mass from the sphenoidal ostium filling the choana	Polypoidal mass site of origin mostly sphenoidal air cell filling whole choana	Endoscopy assisted polypectomy with widening of sphenoid ostium	Nasal inflammatory polyposis	15 days, 3months, 6 months, 1 year – no recurrence

V. Review of Literature

The majority (100%) of the patients with choanal polyp in our study presented with nasal obstruction, followed by snoring, sleeping with the mouth open (25.0%), and nasal discharge (50%), epistaxis (25%). Association of epistaxis can be very well related with the rhinosporidiosis.

Kizil et al in his study about choanalpolyposis, analysed and summarised that Choanal polypsare unilateral benign masses usually originating from paranasal sinuses. Maxillary, ethmoid, and sphenoid sinuses are involved in order of decreasing frequency. A total of 98 patients with a mean age 24.3 years were analyzed. Histopathologic diagnoses were CP in 94 patients and inverted papilloma in 4 patients. The sites of origin were maxillary sinus in 89 patients (90.8%), sphenoid sinus in 6 patients (6.1%), bulla ethmoidalis, inferior concha, and uncinate process in 1 patient each (1.0%)[2]. The most common symptoms were nasal obstruction (98.0%) and postnasal drip (30.6%).Thus hereby from the various literatures we can conclude that choanal polyps most common presentation is nasal obstruction and choanal polyps of sphenoid and lateral wall of nose are very rare.

17 year old male patient the polyp was seen arising from the sphenoidal ostium and entering into choana causing obstructive symptoms to the patient. FESS was done and specimen was sent for histopathological study. And the report was nasal polyposis. It is a very rare presentation with very few literatures available worldwide[3]. (figure 1)

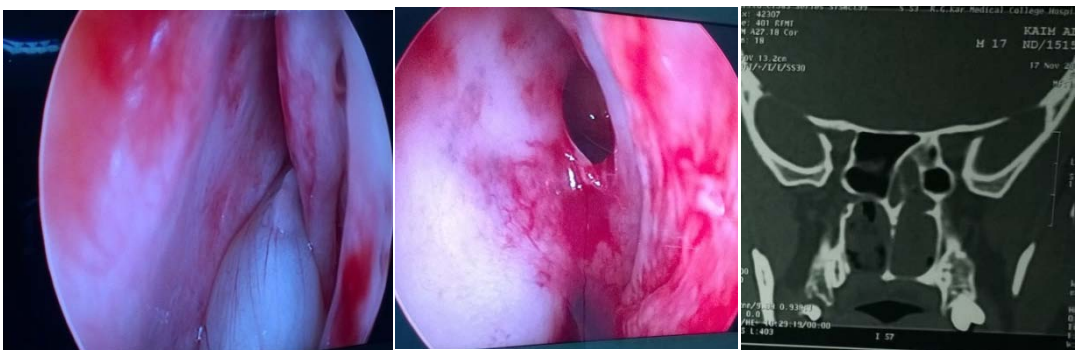

Figure 1 : Sphenochoanal polyp

Dual pathology of nasal polyposis and rhinosporidiosis from the same patient is a very rare scenario not reported in literature. The young male patient 27 years old had complaints of nasal obstruction on DNE polypoidal mucosa was arising from the nasal septum and was filling the choana. The choanal part of the polyp was found to have rhinosporidium embedded. The mass was carefully excised. The excised mass was clearly labelled as macroscopically it contained to different tissue and the reports were turned out to be specimen labelled as strawberry like growth in the choana was rhinosporidiosis and the specimen labelled as stalk of the polyp was found to be polypoidal mass, hence confirming the macroscopical finding (figure 2). Earlier rhinosporidiosis presenting as a urethral polyp has been reported[4].

Figure 2 : Rhinosporidiosis as a polyp

The young male 23 years old was found to have a polypoidal mass seen arising from the lateral wall of nose. It consisted of two stalks both were found attached to the inferior turbinate. The mass was found extending along the floor of nasal cavity and presenting as choanal polyp from lateral wall of nose. Choanal polyps arising from the lateral wall of nose is very rare. Very few cases have been reported world-wide.

The female patient 38 years old found to have a polypoidal mass arising from the septum and the mass was found entering into nasopharynx. The mass was excised along with the muco periosteal layer of the bony septum were the stalk was attached and sent for HPE. (Figure 3) The reports turned out to be respiratory epithelial hamartoma. These benign tumours will usually mimic polyps. Proper histopathological study is necessary to rule out the diagnosis. Immunohistochemistry studies were done to confirm the diagnosis. The etiology of respiratory epithelial adenomatoidhamartoma (REAH) is unknown although inflammation may induce gland proliferation observed in hamartomas. One of our cases was associated with nasal polyposis. REAH is a self-limiting disease, so it is important to differentiate REAH from other pathologic process, including inverted papilloma and low-grade adenocarcinoma. The treatment of choice is complete excision through a conservative approach[5]. REAH is one among the rare presentation of choanal polyps. Proper histopathological differentiation is very necessary.

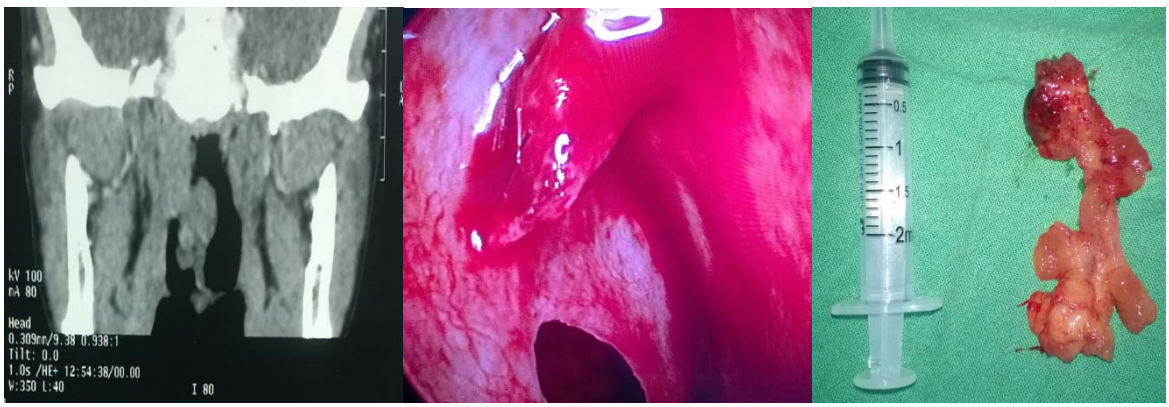

Figure 3 : Respiratory epithelial adenamatoid hamartoma (REAH)

The main differential diagnosis is the antochoanal polyp. These polyps are more common compared to polyps from sphenoids or ethmoids. With the help of CT scan it is very easy to establish the diagnosis of polyp, whether it originates from maxillary antrum or sphenoid or from the ethmoidal air cells[6]. Even if we are seeing opacification of both maxillary and sphenoidal sinuses in the CT scan, diagnostic nasal endoscopy will be very clearly describing the polyp where it is from either maxillary antrum or from the

sphenoethmoidal recess. It is very important because the non-diseased sinus can be left out without doing any surgery. Thus by clearly understanding the pathology only the diseased air cells are removed and its ostium is widened and so normal sinuses are left untouched thereby restoring the proper function of the Para nasal air sinuses.

Ilia K et al in their retrospective analysis of surgical approach for choanal polyps have proved that there is no significant difference in outcome in open procedures and endoscopic procedures.they have also finalised that Endoscopic approach is a safe and effective procedure for choanal polyp treatment. There was no significant difference between the success rates of the endoscopic approach and combined approach. Hence Endoscopic procedures can be said as the treatment modality of choice in choanal polyposis[7].

The other common differential diagnosis that we have to keep in mind is meningoencephalocele, nasal angiofibroma and inverted papilloma. Meningoencephalocele can be diagnosed as they present with imperfection of the skull base and may be having communication between nasal cavity and cerebral cortex. It can be confirmed by radiological study and diagnostic nasal endoscopy [8]. Angiofibromas will usually present with recurrent epistaxis. Inverted papilloma will be usually presenting in old age patients.

Thus points of interest to be noted from this study are (1) nasal polyposis of unusual presentation and rare pathology has to be evaluated properly. (2) Though radiological study is done in all patients it is of prime importance to go for Diagnostic nasal endoscopy before planning for surgery. (3) Endoscopic sinus surgery is the treatment of choice with least morbidity and no recurrence (4) macroscopically if we are suspecting some unusual entities as listed above should be properly labelled and sent clearly for proper histopathological confirmation.

VI. Conclusion

In young patients with a history of unilateral progressive nasal obstruction, it is always necessary to rule out choanal polyp. Although antrochoanal polyps are the most common, it is not a rule. Choanal polyp can also originate from sphenoid sinus and ethmoidal sinus, nasal septum and lateral wall of nose. Rare cases of these presentations are also reported. Endoscopy assisted surgery is the treatment of choice. Endoscopy can also be used as a diagnostic guide when CT scan findings are inconclusive in differentiating antrochoanal and sphenochoanal polyp. One must also keep in mind the other possible differential diagnosis.

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Assessment of Short Term Chloroquine-Induced Ototoxicity in Malaria Patients

By Vijayalakshmi Subramaniam & Ravi N Vaswani
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Abstract- *Objective:* To evaluate the effects of chloroquine phosphate on cochlear function using clinical and audiometric studies when administered in regular doses and in the recommended regimens, for the treatment of malaria.

Study design and setting: Prospective, cohort, observational study, with convenience sampling, in a tertiary care hospital.

Methodology: All subjects proved or presumed to be suffering from malaria and who received chloroquine phosphate treatment were inducted into the study. Base line clinical examination with detailed ear examination was carried out. Audiometric evaluation was carried out prior to treatment. All patients were treated with chloroquine phosphate tablets (1200mg) stat followed by 600 mg every 12 hours for 4 doses and paracetamol on a qrn basis. The study endpoints were development of ototoxic symptoms/signs or completion of the course as prescribed by the treating physician. Upon achieving any of the endpoints, the clinical examination and audiometric test battery was repeated.

Keywords: *ototoxicity, chloroquine, malaria.*

GJMR-J Classification: *NLMC Code: WV 21*

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Results: Only 2 subjects showed a change in hearing thresholds on high frequency audiometry following administration of chloroquine. The Auditory Brainstem Response (ABR) and Otoaccoustic Emission (OAE) were also abnormal in these 2. All the others showed no change in clinical or audiometric profile following administration of chloroquine. Only one subject showed vestibular side effects in the form of giddiness and nystagmus which spontaneously resolved on completion of therapy.

Conclusions: Chloroquine is not significantly ototoxic when administered in regular doses for treatment of uncomplicated malaria. The ototoxic effects of chloroquine which are rarely encountered are fully reversible.

Keywords: ototoxicity, chloroquine, malaria.

I. Introduction

Chloroquine is a drug with wide spread clinical applications. It has long been used in the treatment or prevention of malaria. As it mildly suppresses the immune system, it is used in some autoimmune disorders, such as rheumatoid arthritis and lupus erythematosus. Chloroquine is in clinical trials as an investigational antiretroviral in humans with HIV/AIDS and as a potential antiviral agent against chikungunya fever.[1,2] The radio-sensitizing and chemo-sensitizing properties of chloroquine are beginning to be exploited in anticancer strategies in humans.[3,4] Ototoxicity due to chloroquine (cochlear and sometimes vestibular) has been reported by many. This is usually but not always, dose –dependent and reversible.[5,6]

Mangalore is endemic for malaria. Not just in numbers but also in terms of unusual presentations. Considering that many clinicians empirically prescribe chloroquine for febrile patients, it is one of the most prescribed drugs in this area. This cohort study was designed to investigate the effect of chloroquine on cochlear function using clinical and audiometric studies when used in the regular treatment of malaria.

II. Methods

This prospective, cohort, convenience sampling study comprised 30 patients to be treated with chloroquine phosphate at the Yenepoya Medical College Hospital, Mangalore. All patients (whether admitted or not) proved or presumed to be suffering from malaria who were to receive chloroquine phosphate treatment were included in the study after informed valid consent. Patients were excluded from the study if they had received a course of chloroquine, in the past seven days. Also, those suffering from complicated malaria, hearing disorders, receiving any other ototoxic drug (including quinine), baseline audiometry showing any form of hearing loss, history of allergy to chloroquine, those who refused participation in the study or those who were lost to follow-up were excluded from the study.

Before starting treatment with chloroquine, baseline clinical examination with detailed ear examination was carried out. Functional assessment of hearing was done using tuning fork tests. Pre-treatment audiometric evaluation comprised pure tone audiometry with high frequency audiogram, brain stem evoked response audiometry (BERA) and otoacoustic emissions. All patients enrolled in the study were administered chloroquine phosphate. The course consisted of a stat dose of chloroquine phosphate 1200 mg, followed by 600 mg every 12 hours for 4 doses. The only other medicine administered was paracetamol (acetaminophen) which was given only on qrn basis. No other anti malarial or antibiotic was administered, unless clinically determined and in such a case the subject was subsequently excluded from the study. The clinical examination and audiometric test battery was repeated upon completion of treatment.

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The data obtained was tabulated and analysed for incidence, type, severity and course of chloroquine induced ototoxicity.

III. Results

Within the data collection period, 45 patients with a definitive or presumed diagnosis of malaria were to be given chloroquine phosphate. Of these 6 were excluded on account of discharging ears with clinical diagnosis of chronic suppurative otitis media (CSOM) and abnormal audiometry. Furthermore, 9 patients were lost to follow up. Thus a total of 30 patients in the age range of 14-58 years were included in the study, of which 28 were males and 2 were females.

None of the patients had any ear abnormality on clinical examination before treatment. None of the subjects reported diminished hearing or tinnitus following therapy. Tuning fork tests did not reveal any form of hearing loss prior to or after treatment with chloroquine. Hearing thresholds on pure tone audiometry were reported to be normal in all subjects prior to and after treatment with chloroquine. However, high frequency audiogram revealed bilateral mild hearing loss at 12 kHz in one subject and bilateral mild to moderate hearing loss at 8 kHz in another following treatment, not accountable to any other obvious cause.

ABR was normal in all subjects prior to treatment. Abnormal wave V latency was observed in the 2 subjects who had high frequency hearing loss. OAEs were found to be abnormal only in the 2 subjects who reported high frequency hearing loss following treatment. A follow- up audiogram after one month of therapy was found to be normal. Only one patient reported giddiness on the second day of therapy. He was found to have spontaneous nystagmus, fast component to the left. His symptoms and nystagmus disappeared spontaneously on completion of treatment.

IV. Discussion

Drugs that induce ototoxicity have been a well-recognised cause of cochlear hearing loss. Ototoxicity because of classic antimalarial drugs such as quinine have been well established for many years. It manifests as both auditory and vestibular dysfunction, and it is typically mild to moderate, bilateral and symmetric; hearing is usually restored after cessation of the drug.[9] Despite reports of chloroquine resistance, it is the most widely used anti malarial in the world. It is also being used widely in the treatment of rheumatoid arthritis and other connective tissue diseases. Ototoxicity is a rare but well-established side effect of hydroxychloroquine when used in rheumatoid arthritis, idiopathic pulmonary hemosiderosis and other connective tissue diseases. Sensorineural hearing loss following chloroquine therapy has been reported to be dependent on dose and duration of treatment and observed to be reversible by many [5,6,7,8] while some have reported it to be irreversible.[10,11] Chloroquine sulphate was found to be highly toxic in guinea pigs when administered in single doses in excess of 40mg/kg. The spiral organ was assessed in segments each of 100 outer hair cells in length and the percentage of damaged inner and outer hair cells for each segment was calculated. No evidence was found to suggest that chloroquine causes permanent damage to the hair cells.[12]

This study was conducted to evaluate the effects of chloroquine on cochlear function when used in regular doses for the treatment of malaria in Mangalore which is endemic for malaria, not just in numbers, but also in terms of unusual presentations, mixed and occult infections. Apart from baseline clinical examination with detailed ear examination including functional assessment of hearing by way of tuning fork tests, all subjects enrolled into the study were subjected to an audiometric test battery comprising of pure tone and high frequency audiometry, brain stem evoked response audiometry and otoacoustic emissions. Ototoxicity has been reported to be generally detected by high frequency auditory testing before it can be detected by conventional audiometric procedures.[13] While brain-evoked response audiometry has been reported to be the most sensitive test in detecting early manifestations of cochlear injury caused by chloroquine when still in a reversible stage[2], transient evoked acoustic emissions have been proposed recently as a better way of monitoring hearing loss produced by ototoxicity and can be suggested as an alternative to monitor hearing loss.[14,15,16]

Only 2 out of the 30 subjects studied developed hearing loss in the high frequencies after chloroquine therapy. The follow up audiogram of these individuals showed that the ototoxic effects of chloroquine were reversible. The sole subject who developed vestibular side effects in the form of giddiness and nystagmus had spontaneous resolution of symptoms on completion of therapy. This shows that chloroquine is not significantly ototoxic when used in regular doses in the treatment of uncomplicated malaria. Ototoxic effects if any are reversible in nature.

V. Conclusion

Chloroquine may be used safely in regular doses in the treatment of uncomplicated malaria as ototoxic side effects are very rare and reversible in nature. Audiometric evaluation could be performed prior to and after therapy in patients at-risk for ototoxicity, receiving therapy in order to document and monitor hearing loss due to chloroquine.

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Knowledge, Attitude and Practices Regarding Consumption of Carbonated Beverages among School Children Residing in New Delhi and Ghaziabad

By Nitya Rai, Meera Sandhu & Vinod Sachdev
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Abstract- *Aim:* The aim of the study was to assess the Knowledge, Attitude and Practices regarding consumption of carbonated drinks among school children, of different socio-economic group.

Material and Method: 350 students in the age group (8-17 yrs.) were included in the study, divided into two groups based upon their socio-economic status. Self-structured objective type questionnaire containing 11 questions, were prepared and distributed.

Stastical Analysis Used: The data was analysed statistically using Pearson Chi-Squares test.

Results: Children of upper income group had more knowledge regarding ill effects of beverages as compared to lower income group ($p<0.05$). Beverages were more popular among upper income whereas milk was favorite among lower income group ($p<0.001$). In upper income group taste was the most influencing factor for the choice of the drink whereas in lower income friends and family were ($p<0.001$).

Keywords: *carbonated beverages, erosion, school children.*

GJMR-J Classification: *NLMC Code: WU 300*

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Knowledge, Attitude and Practices Regarding Consumption of Carbonated Beverages among School Children Residing in New Delhi and Ghaziabad

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Conclusion: The frequency of consumption is alarming and the target group is still unaware of the fatal health effects of these drinks, suggesting the need of immediate attention by health and concerned government authorities worldwide

Keywords: carbonated beverages, erosion, school children.

I. Introduction

In today's world, consuming sparkling beverages has become a trend. As an undesirable increase in the ease of availability of these soft drinks its consumption has drastically taken a leap over the past few years. Fluid consumption patterns of children are now more diverse compared to the past years, as carbonated soft drinks and fruit juices have replaced the consumption of water and milk.

These carbonated drinks consist of water, carbon dioxide, color, additives and preservatives. In a tropical country like India, which has torrid summers, there is substantial market for aerated soft drinks. The per capita consumption of carbonated drinks in India is about [4] bottles per year, which is less compared to the other developing countries such as Pakistan, Bangladesh, Egypt, and extremely less compared to USA where it is 350 bottles [1]. Indian market consists of cola products and non-cola products of which the cola segment constitutes 62%, non-cola segment is bagged with 30% and energy drinks segment is 8%. Furthermore, the urban areas report a dramatically high consumption of aerated drinks as compared to rural areas, where Delhi is on the top of the list for Carbonated Soft Drink consumption[2].

The excess consumption of these carbonated beverages is creating havoc in teenage population as it contains no essential nutrients and harms their general as well as oral health. Consumption of carbonated soft drinks may be a key contributor to the epidemic of obesity, as consuming more energy than the body requirement leads to weight gain due to the body storing excess energy as fat. Intake of these drinks may also lead to tooth decay[3] and dental erosion[4]. High consumption of carbonated soft drinks during adolescence may reduce bone mineral accrual and increases fracture risk[5]. Another observed repercussion of consumption of these empty calories is hyperacidity, leading to erosion of stomach lining, characterized by stomach ache. These symptoms are caused by caffeine and acids found in these "sweet demons" such as acetic, fumaric, gluconic and phosphoric acid[6].

It is an area of growing concern, as consumption of these drinks has markedly increased and they are capable of producing a large number of ill effects on oral and general health of the younger population. Hence, the present study was undertaken to assess the knowledge, attitude and practices (KAP) of school students toward carbonated drinks consumption.

II. Material and Methods

A Self-Structured objective type questionnaire was prepared for collection of data. Approval was taken from Ethical committee of the institution.

This study was conducted among school going children aged between 8 and 17 years. The total number of students included were 350 (200: males and 150: females), which were divide into two groups based upon

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there socio-economic status using kuppuswamy's socio-economic status scale[7].

Group I- 175 children from upper socio economic group.

Group II- 175 children from lower socio economic group.

Sample size was calculated using Random (non-cluster) sampling.

$n = Z^2 P (1-P)/d^2$

Z =95%, P= 0.65 and d= 0.05

A signed consent was taken from the parents of the students who were included in the study. A questionnaire containing 11 questions was prepared for data collection. 350 questionnaires were distributed to the school students. The respondents were then asked to tick the most appropriate correct answer from the given list of answers according to them, in order to assess their knowledge, attitude and practice regarding the consumption of carbonated beverage. Questionnaire was prepared to assess whether they knew, that these carbonated beverages have ill effects on oral and general health. Did they enjoy drinking carbonated beverages and what would they choose if given choice among cold drink, fruit juice, milk and maza /slice. Factors which influenced the choice of drink such television, easy availability in the market, color and taste of the drink, or family and friends was also assessed. How much of the amount, frequency of consumption, where did they preferred to consume, and which was there favorite among those available in the market was questioned. The obtained results were subjected to statistical analysis using Pearson Chi-Square test SPSS version 16.

III. Results

Table 1 : Knowledge of students regarding consumption of carbonated beverages

Questions	Responses	Group I N (%)	Group II N (%)	p-value
Have you heard about cold-drinks	Yes	175(100%)	170(97.7%)	0.061
	No	0(0%)	4(2.3.%)	
Do you have any idea if it has Bad Effects On Teeth	Yes	145(82.9%)	124(71.7%)	0.015
	No	30(17.1%)	49(28.3%)	
Do you think having these cold-drinks is	Good for health	8(4.6%)	37(21.9%)	< .001
	Bad for health	167(95.4%)	132(78.1%)	

Table 1: 100% from Group I and 97.7% from Group II had heard about carbonated beverages, but still 2.3% in Group II were still unaware about carbonated beverages (p=0.061). 82.9% from Group I and 71.7% from Group II knew that consumption of these beverages is harmful for teeth and still 17.1% from Group I and 28.3% from Group II thought that they don't cause any harm to oral health and difference was highly significant (p=0.015). 95.4% from Group I and 78.1% from Group II knew that consuming these beverages is bad for general health though 4.6% from Group I and 21.9% from Group II considered it to be good for health(p<0.001).

Table 2 : Attitude of students regarding consumption of carbonated beverages

Questions	Responses	Group I	Group II	P-value
Do you enjoy having Cold-drinks	Yes	158(90.8%)	140(81.4%)	0.013
	No	16(9.2%)	32(18.6%)	
If Asked To, Would You Stop Drinking Cold-drinks	Yes	41(23.4%)	65(38.9%)	< .001
	No	53(30.3%)	66(39.5%)	
	May-be	81(46.3%)	36(21.6%)	
What Would you choose out of these drinks	Fruit Juice	63(36%)	61(34.9%)	< .001
	Carbonated Drink	60(34.3%)	6(3.4%)	
	Maza/Slice	41(23.4%)	41(23.4%)	
	Milk	11(6.3%)	67(38.3%)	

Table 2: 90.8% from Group I and 81.4% from Group II enjoyed drinking cold drink. Still 9.2% from Group I and 18.6% from Group II didn't enjoy drinking carbonated beverages (p=0.013). 23.4% from Group I said that they will quit drinking, 30.3% said they won't, and 46.3% said that they might when asked to. And on other hand in Group II 38.9% said that they will quit drinking, 39.5% said they won't, and 21.6% said that they might when asked to (p<0.001). 36% preferred fruit juice and 34.3% carbonated beverages in group I while those in group II preferred 38.3% milk over 34.9% carbonated beverages(p<0.001)

Table 3 : Practices of students regarding consumption of carbonated beverages

Questions	Responses	Group I	Group II	P-value
How Do You make the choice of Your cold-drink	T.V	13(7.5%)	25(14.4%)	< .001
	Easy availability in market	14(8.0%)	32(18.4%)	
	Colour	31(17.8%)	5(2.9%)	
	Family & friends	18(10.3%)	70(40.2%)	
	Taste	91(52.3%)	37(21.3%)	
	Other	7(4.0%)	5(2.9%)	
At a time how much of these drinks do you prefer having	A Glass (100ml)	89(50.9%)	133(76.0%)	< .001
	A Glass Bottle(200ml)	36(20.6%)	33(18.9%)	
	Pet Bottle (500ml)	32(18.3%)	5(2.9%)	
	>500ml	18(10.3%)	4(2.3%)	
How often Do You Consume Cold-drinks	Daily	20(11.4%)	36(21.1%)	>0.05
	Every alternate days	18(10.3%)	17(9.9%)	
	Weekly	77(44.0%)	66(38.6%)	
	Monthly	60(34.3%)	52(30.4%)	
Which is Your Favourite Drink	Pepsi	38(21.8%)	33(19.3%)	=0.001
	Coke	51(29.3%)	21(12.3%)	
	Sprite	26(14.9%)	31(18.1%)	
	Mirinda	21(12.1%)	22(12.9%)	
	Mountain Dew	18(10.3%)	22(12.9%)	
	Thumps Up	20(11.5%)	42(24.6%)	
When do you like having these drinks	When at home with friends & family	53(30.3%)	84(48.6%)	< .001
	When out with family & friends	103(58.9%)	53(30.6%)	
	When I Feel Thirsty	19(10.9%)	36(20.8%)	

Table 3: Those belonging to Group I were more influenced by taste 52.3% compared to other factors i.e color 17.8%, market 8%,T.V 7.5%, whereas in Group II family 40.2% and taste 21.3% influenced choice of drink more in comparison to market 18.4%,T.V 14.4% ($p<0.001$). Children in both the Groups preferred to drink a glass 50.9% in Group I and 76% in group II ($p=0.113$). Group I students preferred to drink on a weekly basis 44%,whereas in Group II weekly consumption was 38.6%, and daily was 21.1% which was high compared to Group 1 being 11.4% ($p<0.001$). Coke29.3%was the most favorite among Group 1 and thumbs-up 24.6% among group II ($p<0.001$). Those in Group I preferred to drink when they were out 58.9% as compared in Group II as they preferred to drink when at home 48.6% ($p<0.001$).

IV. Discussion

A questionnaire study was undertaken, as it allows to collect a lot of information and data from a large number of respondents in a short span of time. Aerated beverages are an important sector in the country because it not only contributes to export earnings of the country, but also acts as a revenue driver for other industries such as glass, refrigeration, transport, paper and sugar. This segment is universal in its demand, catering to all income groups and age-brackets[8]. Consumption of these carbonated beverages is becoming a major factor for health issues faced by the future generation.

In the study it was found that majority of the school children in both the groups had heard about cold drinks. But regarding knowledge of its ill effect on teeth, the upper socio-economic group had (82.9%) more knowledge, as compared to lower socio-economic group (71.1%) (Table 1). The area of concern is that their deleterious association with human teeth induces demineralization causing erosion of enamel due to their high acidic pH which ranges between 2.5-3.4. During demineralization, calcium and phosphorus are removed from the enamel which eventually leads to loss of outermost layers of the enamel causing sensitivity, other is tooth decay caused by sugar content as high as 10 tea spoons of sugar in every 250ml of this toxic elixir in the younger age group.

The finding of the study depicts that, carbonated drinks (34.3%) and fruit juices (36.0%) were more popular in the upper income group, and milk (38.3%) and fruit juice (34.9%) in the lower income group (Table 2). Popularity of these "sparkling beverages" is still more in upper socio-economic group, as children belonging to lower income group preferred milk and fruit juice more over the carbonated beverages.

Weekly consumption was common in both the group's i.e. upper socio economic group (44.0%), and lower socio economic group (38.6%)(Table 3). Not only the frequency, but the method of drinking also plays an important role, as holding the drink in the mouth before swallowing leads to the most pronounced pH drop followed by the long-sipping method[9]. Most of the

children in the upper income group were influenced by taste (52.3%) and color (17.8%) of the drink, while those belonging to the lower income group were more influenced by parents (40.2%) at young age which is in agreement with the findings of Grimm et al. (2004)[10]. Soft drink companies use a wide variety of marketing techniques to increase their sales. These techniques include easy accessibility in a wide variety of venues including schools, heavy media advertising as pre-teens and young adults are more vulnerable to get influenced by such factors. People who consume sugary drinks regularly i.e one to two cans a day or more have a 26% greater risk of developing type 2 diabetes than people who rarely have such drinks[11]. According to a study, people who increased their sugary drink consumption by one 12-ounce serving per day gained more weight over time approximately an extra pound every four years than people who did not change their intake[12]. Surprisingly in the study it was seen that influence of parental soft drink intake is more than peer influence, which directly reflects the responsibility of the parents. Parents should be aware that their behavior regarding the consumption of beverages has a great impact on their children's intake habits as well. So, health promotion strategies should be implemented, involving both parents and children. The parents can be helpful in exposing children to healthier drinks available in the market. Studies have shown that the frequent consumption of soft drinks can lead to change in body mass index (Ludwig et al. 2001[13], Striegel Moore et al. 2004[14]. and increase the frequency of obesity in children (Welsh et al. 2005[15]), which is becoming a common health issue in children nowadays. This concern is growing by each passing day, as the population of upper income group is adapting to a western lifestyle thereby more affected by adverse health conditions as a consequence. In contrast, the low income group is still fascinated by the traditional Indian diet which is rich in nutrients and has less harmful contents.

In the present study, not every student was aware about the hazardous effects of carbonated beverages on general and oral health. Government strategies should be implemented in promoting healthier drinks at a low cost in the market, reducing production of soda drinks and encouraging the future of our nation to adapt to a healthier living as a well-known proverb is "An ounce of prevention is worth a pound of cure"

V. Conclusion

82.9% in upper socio economic and 71.7% in lower socio economic group had knowledge of ill effects of carbonated drinks on oral health. 46.3% in upper socio economic groups said they may discontinue consuming these popping beverages and 38.95% in lower socio economic group were ready to quit consuming carbonated beverages when they came to know about the hazardous effect of fizzy drinks. Most influencing factors for the choice of their drink were taste (52.3%) in upper socio economic group and (40.2%) family in lower socio economic group. So there is a need to, spread awareness among children at a younger age and their parents about the adverse effects of soft drinks, so as to inculcate good oral practices. As the concern is growing, thus it is necessary to provide data to the concerned planning authority, so as they can implement an integrated approach to overcome the plight associated with consumption of carbonated beverages.

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Perceived Competency towards Dental Practice among Interns of Various Dental Colleges in Delhi NCR

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Abstract- Aim: The number of dental colleges has increased markedly and so has the number of dental graduates. But the dental curriculum has not been modified to cater to the needs of the people. Hence the aim of this study was to assess self-perceived competency of interns towards dental practice among dental colleges of Delhi NCR.

Material and Methods: A cross sectional questionnaire study was conducted Self- perceived competency of interns was assessed using a valid self–administered questionnaire with 10 parameters and 76 closed ended questions.

Statistical Analysis: Data collected was analyzed and frequency tables were computed using statistical software packages SPSS software windows (version 22.0).

Results and Conclusion: Majority of interns felt they were not skilled enough in performing procedures which are the basic requisites in running a dental operatory. Hence it was concluded that there exists a need to change the current curriculum and promote competency based education for it is these aspiring dentists who will decide the future of oral health in our country.

Keywords: *delhi NCR, interns, self-perceived competency.*

GJMR-J Classification: *NLMC Code: WU 21*

Strictly as per the compliance and regulations of:

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Punya Sekhri [α], Meera Sandhu [σ] & Vinod Sachdev [ρ]

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I. Introduction

Dentistry in India is being practiced since the era of the Indus Valley civilization. Ancient medical literature described treatments of diseases of oral cavity and emphasized the importance of tongue hygiene. The first dental college and hospital in India was opened in 1883.

Until 1966, all the dental colleges in India were either run by the government or aided by the government.[1] Since dental disease is a serious public health problem with equal distribution and affecting all age groups, the demand of providing oral health care to all had to be met. Therefore dental colleges in private sector were established. India has approximately 290 dental colleges with around 25,000 graduates passing each year and dental manpower has greatly increased. Decrease in the number of schools for hygienists and laboratory technicians from forty (20+20) in 1990s to twenty (10+10) in 2000 with the result that there has been no increase in the efficiency of overburdened dentists.[2] But even with such a large work force, most of the people in India do not have access to basic oral health care.

The dentist to population ratio is 1:10,000 in urban areas whereas it drastically falls to 1:150,000 in rural areas. This unequal distribution of dentists contributes to emergence of oro-dental diseases in India. Recent estimates state that about 50% of school children are suffering from dental caries and 90% of adults are having periodontal disease. Oral cancer is also emerging as a major threat among young generation due to increased usage of tobacco products.[3]

Although dental care is a part of primary health care in India, dental care services are available in very few states at the primary health care level. In regions where adequate dental manpower is available yet the utilization of oral health care services is low thereby widening the oral health care differences across the social economic classes. Various factors like demographic, behavioral, socio-economic, cultural and epidemiological contribute to people's decision to either forgo care or seek professional assistance for dental problems.[4]

To bring down the burden of oral diseases, various health education programs and preventive programs were organized by the government authorities, private colleges and organizations but the major responsibility lies in the hands of aspiring dentists. Previously dental education was fabricated in such a way that a dental graduate would only learn prescribed subject matter as per the traditional curriculum in order to retain knowledge. This traditional approach was very restricted and bounded. The current trend is toward competency and evidence based education. While literature continues to emphasize on competencies when discussing dental education, ambiguity remains. An education based upon competency offers several advantages which incur a positive attitude in the aspiring dentists to independently work in a clinical set up.[5]

Change is the only constant and also the need of the hour. Hence this study was carried out to estimate

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the self- perceived competency towards dental practice among interns of various dental colleges in Delhi NCR.

II. Materials and Methods

In the present study 5 dental colleges from Delhi NCR were chosen at random. Interns of these dental colleges in the academic year 2013-14 constituted the study population. Interns who were willing to take part in this study and those who were on the verge of completion of their internship(last one month of internship) were included as they were equally exposed to all the branches of dentistry by this time period and those who had previously taken part in any such study were excluded.

A cross sectional questionnaire study was conducted in the Department of Pedodontics and Preventive Dentistry I.T.S C.D.S.R Muradnagar Ghaziabad. Prior to start of the study an approval from the concerned dental authorities and ethical committee was obtained. The sample size was determined using the statistical formula $E = z\sqrt{p(1 - \hat{} p)/ n}$ with 95% level of confidence and 5% precision. Self- perceived competency of interns was assessed using a valid self–administered questionnaire with 10 parameters and 76 closed ended questions.

The various aspects included were 'General Patient Management', Periodontology and Dental Public Health',' Conservative Dentistry', 'Oral Rehabilitation', 'Orthodontics', 'Pedodontics', 'Oral and Maxillofacial Surgery', 'Oral Medicine and Radiology', 'Oral Pathology' and 'Drug and Emergency Management'.

After informing the interns about the intent and purpose of this study the questionnaires were distributed.500 questionnaires were distributed, out of which 300 were returned completely filled and the data collected was analyzed and frequency tables were computed using statistical software packages SPSS software windows (version 22.0)

III. Data Analysis

A total of 500 questionnaires were distributed among the interns of five dental colleges of Delhi NCR. Of which 300 questionnaires were returned and free from errors and considered for further analysis. The data collected was analyzed and frequency tables were computed using statistical software packages SPSS software windows (version 22.0).

On frequency distribution it was seen that 100% of the interns felt that they were very well prepared to develop sequential plan for the patient and in interpreting tests and history to make diagnosis (Table 1). The same percentage perceived to be very well prepared in performing scaling and root planning (Table 2), restoring teeth with amalgam (Table 3), replacing teeth with partial and complete dentures (Table 4), in differentiating between primary and permanent teeth and in motivating the child and his parents in maintaining good oral health.(Table 6)

However, 300 interns felt that they were poorly prepared in performing multi-root RCTs and in restoring teeth with metal, PFM and all ceramic crowns and also in performing bleaching and restoring teeth with post and core (Table 3). The same percentage perceived to be very poorly prepared in replacing teeth with fixed partial dentures, implants, conventional bridges and resin bonded bridges (Table 4). They also perceived to be very poorly prepared in performing minor tooth alignment, in performing pulp therapy in primary teeth, treatment of traumatic injuries, bleaching, apexification, apexogenesis, diagnosing speech problems, giving stainless steel crowns, space maintainers and regainers and in managing mentally or physically disabled patients, in performing Incision and Drainage and managing fractures of dento-facial complex, in performing soft tissue biopsies and in managing medical emergencies (as shown in Tables 5,6,7,8,9 and 10).

Table 1 : Preparedness of interns in recording General Patient Management

	Very poorly		Poorly		Well		Very well	
GENERAL PATIENT MANAGEMENT	n	%	n	%	n	%	n	%
Take and interpret medical, social and dental history	0	0	0	0	26	8.7	274	91.3
Communicate effectively with patients	0	0	0	0	30	10	270	90
Discuss treatment plans and get informed consent	0	0	0	0	61	20.3	239	79.7
Discuss fees and payment options with patients	0	0	13	4.3	287	95.7	0	0
Develop a sequential treatment plan	0	0	0	0	0	0	300	100
Interpret tests and history to make a diagnosis	0	0	0	0	0	0	300	100
Identify and address patient's chief complaints	0	0	0	0	184	61.3	116	38.7

Table 2 : Preparedness of interns in the Department of Periodontology and Dental Public Health

	Very poorly		Poorly		Well		Very Well	
PERIODONTOLOGY AND DENTAL PUBLIC HEALTH	n	%	n	%	n	%	n	%
Treat early periodontal treatment	0	0	0	0	130	43.3	170	56.7
Perform deep scaling, root planing	0	0	0	0	0	0	300	100
Perform periodontal surgery	300	100	0	0	0	0	0	0
Perform oral hygiene instructions and diet analysis	0	0	0	0	21	7	279	93
Provide and monitor preventive treatment	0	0	0	0	96	32	204	68

Table 3 : Preparedness of interns in the Department of Conservative Dentistry

CONSERVATIVE DENTISTRY	Very poorly		Poorly		Well		Very Well	
	n	%	n	%	n	%	n	%
Restore teeth with amalgam restorations	0	0	0	0	0	0	0	0
Restore teeth with composite resin	0	0	45	15	255	85	0	0
Perform root surface restorations	300	100	0	0	0	0	0	0
Perform single root RCT	0	0	0	0	290	96.7	10	3.3
Perform multi-root RCT	300	100	0	0	0	0	0	0
Restore teeth with crowns								
(i) Metal crowns	300	100	0	0	0	0	0	0
(ii) Porcelain fused to metal	300	100	0	0	0	0	0	0
(iii) All ceramic	300	100	0	0	0	0	0	0
Bleaching	300	100	0	0	0	0	0	0
Restore teeth with post and core	300	100	0	0	0	0	0	0

Table 4 : Preparedness of interns in the Department of Oral Rehabilitation

ORAL REHABILITATION	Very poorly		Poorly		Well		Very Well	
	n	%	n	%	n	%	n	%
Replace teeth with partial dentures	0	0	0	0	0	0	300	100
Replace teeth with cast partial denture	0	0	252	84	48	16	0	0
Fixed Partial denture	300	100	0	0	0	0	0	0
Replace teeth with complete dentures	0	0	0	0	0	0	300	100
Replace teeth with implants	300	100	0	0	0	0	0	0
Replace teeth with conventional bridges	300	100	0	0	0	0	0	0
Replace teeth with resin bonded bridges	300	100	0	0	0	0	0	0

Table 5 : Preparedness of interns in the Department of Orthodontics

ORTHODONTICS	Very poorly		Poorly		Well		Very Well	
	n	%	n	%	n	%	n	%
Perform orthodontic treatment planning	0	0	232	77.3	68	22.7	0	0
Perform minor tooth alignment with removable appliances	0	0	247	82.3	53	17.7	0	0
Perform minor tooth alignment with fixed appliances	300	100	0	0	0	0	0	0
Perform full arch alignment	300	100	0	0	0	0	0	0

Table 6 : Preparedness of interns in the Department of Pedodontics

PEDODONTICS	Very poorly		Poorly		Well		Very Well	
Differentiate b/w primary and permanent teeth	0	0	0	0	0	0	300	100
Infant Oral Health Care	242	80.7	58	19.3	0	0	0	0
Pit and Fissure Sealant	242	80.7	58	19.3	0	0	0	0
Topical Fluoride Application	242	80.7	58	19.3	0	0	0	0
Perform Behavior Management	0	0	0	0	249	83	51	17
Motivate child to maintain good oral hygiene	0	0	0	0	0	0	300	100
Motivate parents/ guardian	0	0	0	0	0	0	300	100
Perform restorative procedures	0	0	0	0	57	19	243	81
Detection and correction of habits	0	0	252	84	48	16	0	0
Pulp therapy in primary teeth	300	100	0	0	0	0	0	0
Treatment of traumatic injuries	300	100	0	0	0	0	0	0
Bleaching	300	100	0	0	0	0	0	0
Apexification	300	100	0	0	0	0	0	0
Apexogenesis	300	100	0	0	0	0	0	0
Diagnose speech problems	300	100	0	0	0	0	0	0
Give stainless steel crowns	300	100	0	0	0	0	0	0
Perform space maintenance/ or regaining	300	100	0	0	0	0	0	0
Manage mentally or physically disabled patients	300	100	0	0	0	0	0	0
Recognize, report and follow up neglect and abuse cases.	193	64.3	107	35.7	0	0	0	0

Table 7 : Preparedness of interns in the Department of Oral and Maxillofacial Surgery

ORAL AND MAXILLOFACIAL SURGERY	Very poorly		Poorly		Well		Very Well	
	n	%	n	%	n	%	n	%
Manage acute pain/ infection	0	0	206	68.7	94	31.3	0	0
Manage Dento-alveolar abscess	281	93.7	19	6.3	0	0	0	0
Incision and Drainage	300	100	0	0	0	0	0	0
Administer local anesthesia	0	0	0	0	4	1.3	296	98.7
Perform simple extraction	0	0	0	0	4	1.3	296	98.7
Extract impacted third molars	273	91	2.7	9	0	0	0	0
Manage complications of oral surgery	0	0	157	52.3	143	66	0	0
Manage fractures of dento-facial surgery	300	100	0	0	0	0	0	0

Table 8 : Preparedness of interns in the Department of Oral Medicine and Radiology

ORAL MEDICINE AND RADIOLOGY	Very poorly		Poorly		Well		Very Well	
	n	%	n	%	n	%	n	%
Record proper case history	0	0	0	0	0	0	300	100
Generate awareness amongst patients	0	0	0	0	198	66	102	34
Shoot and Develop Radiographs	0	0	0	0	8	2.7	292	97.3
(i) IOPA	300	100	0	0	0	0	0	0
(ii) RVG	300	100	0	0	0	0	0	0
(iii) Extra-Oral	300	100	0	0	0	0	0	0
(iv) Cephalometric	300	100	0	0	0	0	0	0
(v) Lateral View	92	30.7	208	69.3	0	0	0	0
Manage chronic oro-facial pain								

Table 9 : Preparedness of interns in the Department of Oral Pathology

ORAL PATHOLOGY	Very poorly		Poorly		Well		Very Well	
	n	%	n	%	n	%	n	%
Identify and manage oral pathology	262	87.3	38	12.7	0	0	0	0
Perform soft tissue biopsies	300	100	0	0	0	0	0	0

Table 10 : Preparedness of interns in the Department of Drug and Emergency Management

DRUG AND EMERGENCY MANAGEMENT	Very poorly		Poorly		Well		Very Well	
	n	%	n	%	n	%	n	%
Prescribe Drugs	0	0	243	81	57	19	0	0
Prevent and manage local anesthesia complications	0	0	241	80.3	59	19	0	0
Manage medical emergencies	300	100	0	0	0	0	0	0
Prevent and manage dental emergencies	0	0	197	65.7	103	34.3	0	0

IV. Discussion

The education system so far has promoted teaching students in an incremental pattern of prescribed subject matter i.e. conventional curriculum with the aim of instilling and retaining knowledge. It is "competence" and "accomplishment" which mark what the students are expected to or have learned in the course of their professional training programme.

Starting up one's own dental practice or running one's own operatory being the most common dream of every dental graduate, makes it necessary to assess the process and confirm that learning has actually been achieved.

Present study was conducted with the intent to assess the competency of interns of five different colleges of Delhi NCR towards dental practice.

From this study we saw majority of the interns felt well prepared in most aspects of general patient management, taking and interpreting medical, social and dental histories, communicating effectively with the patients, identifying and addressing patients' chief complaints and formulate a sequential treatment plan which was in accordance with a study conducted by McGrath et al (Hong Kong Dental Journal 2005:2;84-91) (6)].. [TABLE 1]

56.7% of Interns felt very well prepared in treatment of early stages of periodontal disease and 100% of them were well prepared in performing deep scaling and root planing procedures. Diet analysis and oral hygiene instructions are basic dental procedures taught in early dental training. It is essential that the interns are well trained in health promotion procedures. 93% of the interns felt very well prepared in performing dietary analysis and in giving oral hygiene instructions. [TABLE 2]

However, 100% of the interns felt poorly prepared in carrying out pericoronitis and curettage. They also felt they were inadequately trained in extraction of impacted third molars and couldn't perform procedures like minor tooth alignment using fixed appliances, full mouth alignment, Fixed partial dentures, in giving crowns, replacing teeth with implants, multi root RCT, post and core, pulp therapy in child patient, bleaching, Incision and Drainage which was in accordance with Greenwood study (Journal of Dental Education 1998;62;307-13).[TABLE 2,3,4,5,6,7]

Practically all interns i.e. 93% felt they were well prepared in performing simple extractions or administering local anesthesia. Interns felt well prepared in restorative procedures like amalgam and composite restorations, single root endodontics as these are the most common procedures in dental practice, as proved in study conducted by McGrath et al Hong Kong (6)]. [TABLE 7,3]

In performing procedures like multi-rooted teeth endodontic treatment 100% of the interns felt they were poorly prepared as poor access and variation in root morphology causes practical difficulties for the dental students. The interns also felt they were incompetent when it came to replacement of teeth with conventional bridges and with the increased demand for conventional bridges and implants to replace missing teeth, the dental curriculum should be modified to solve this issue results correlated with the study done by Greenwood et al (European Journal of Dental Education, 1999;3:153-8)4 .Dental graduates were confident in creating awareness amongst children and their parents in order to maintain a good oral hygiene but poorly prepared in performing most of the procedures in a child patient besides oral prophylaxis and restorations.

They also felt poorly prepared in managing mentally or physically disabled child or recognizing and reporting neglect and child abuse.[TABLE 3, 4, 6]

100% of the interns perceived they could not manage medical emergencies and 81% of them felt that they could poorly prescribe drugs. This is an issue of concern as a risk of medical emergencies accompanies every dental procedure and it is of utmost importance that the dental graduates feel prepared for dealing with such events.[TABLE 10]

A "competent" graduate is the one who is capable of functioning independently in realistic practice settings. Combination of attributes of appropriate knowledge and professional attitudes with reliable performance undertaken in natural settings without assistance is what makes a graduate competent(7), which lacks in them at present.

A continuous assessment rather than end course examination would aid in improving the plight of these graduates as this kind of assessment is

comprehensive and covers broad outcomes rather than a few narrow areas of knowledge which lie within a prescribed educational zone.(7)

This study revealed that in all the clinical departments, dental graduates were trained only to perform conventional procedures such as amalgam restorations, simple extractions, administering local anesthesia, fabricating complete dentures and partial dentures.

Performing procedures which are pre-requisites for running a good dental practice such as multi-root RCT, fabrication of fixed partial denture, post and core, bleaching, resin bonded bridges, stainless steel crowns, pit and fissure sealants, topical fluoride application, the dental graduates appeared to be completely incompetent.

With the current trends shifting towards more advanced techniques and procedures like implants, lasers, esthetic dentistry there is a need to increase the clinical exposure. Inspite of the fact that DCI curriculum (revised in 2007 dciindia.org.in)(8) comprises the list of all the exercises that would enable a dental graduate to practice independently, the exposure to perform these procedures needs to be worked upon.

Replacing "requirements" with "minimal expected procedures" or "thresholds" will instill a great deal of confidence in the dental graduates to work independently and efficiently. (7)

V. Conclusion

To conclude, the interns felt well prepared towards dental practice; however, there exists a lacuna in certain areas of practical training the interns towards dental practice. and this lacunae has to be fulfilled.

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Self Inflicted Cut Throat Injury – A Series of 2 Cases

By Ajay Manickam, Shaswati Sengupta, Rajarshi Sannigrahi, Jayanta Saha, Sk Basu & Souradeep Ray

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Abstract- The incidence and pattern of suicide vary from country to country. Cut throat injuries can beeither suicidal or homicidal. These are well recognized methods of homicide and are less commonly used in suicides and are very rarely accidental. Suicide by incising one's own throatis always associated with hesitation marks and homicidal wounds are not associated with one. Psychiatric illness, psychological stress and poverty are some of the associatedfactors of suicidal cut throat injury. when a patient comes with suicidal cut throat injuries, a multidisciplinary approach is required in the effective management of victims. This requires the close collaboration of the Otorhinolaryngologist, the anaesthesiologist and the psychiatrist.

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Self Inflicted Cut Throat Injury – A Series of 2 Cases

Ajay Manickam [α], Shaswati Sengupta [σ], Rajarshi Sannigrahi [ρ], Jayanta Saha [ω], Sk Basu [¥] & Souradeep Ray [§]

Abstract- The incidence and pattern of suicide vary from country to country. Cut throat injuries can beeither suicidal or homicidal. These are well recognized methods of homicide and are less commonly used in suicides and are very rarely accidental. Suicide by incising one's own throatis always associated with hesitation marks and homicidal wounds are not associated with one. Psychiatric illness, psychological stress and poverty are some of the associatedfactors of suicidal cut throat injury. when a patient comes with suicidal cut throat injuries, a multidisciplinary approach is required in the effective management of victims. This requires the close collaboration of the Otorhinolaryngologist, the anaesthesiologist and the psychiatrist.

I. Introduction

Suicide is one of the leading causes of death in the world. The incidence and pattern of suicide vary from country to country. Cut throat injuries can be either suicidal or homicidal. These are well recognized methods of homicide and are less commonly used in suicides and are very rarely accidental. Suicide by incising one's own throat is always associated with hesitation marks and homicidal wounds are not associated with one. Psychiatric illness, psychological stress and poverty are some of the associated factors of suicidal cut throat injury. Here are case reports of 2 patients who tried to commit suicide by cutting their own neck.

II. Case Report

a) CASE 1

A 32 years of male patent attended ENT emergency of RG Kar medical college with alleged history of suicidal cut throat at around night 2: 00 am. There was severe bleeding from the wound site. The patient was immediately shifted to the emergency OT. First of all tracheostomy was done to secure airway. Then wound exploration was done. No major blood vessels were injured. There was a cut injury over the thyroid cartilage. It was carefully repaired with prolenesuture. Wound was closed by layers. Patient was discharged on the tenth post-operative day and was asked to regularly follow-up in psychiatry department. The patient was followed up in ENT department after 1 month, 3 months and 6 months.

b) CASE 2

A 47 years old male patient attended ENT emergency with history of suicidal tendency and by cutting his own throat. There was severe bleeding from the wound site. The patient was immediately shifted to emergency OT. After securing the bleeding, it was found that the air way was opened. A part of Thyroid cartilage was found missing. Tracheostomy was done and after securing homeostasis wound was closed by layers. The injury in the cartilage was repaired with prolene 3 – 0 sutures. After giving proper counselling, patient was discharged on day 14. The patient was followed up on 1month, 3 months and 6 months.

III. Discussion

It was an age old debate that whether penetrating neck injuries should have been explored or not in the past decade. Now with the advent of various investigations and advancement in science, now selective exploration of neck concept is getting popularized. We have to be also aware of carotid and possible cervical injury in the patient.

Hence penetrating neck trauma can be classified into (1) stab injury (2) gunshot wounds (3) blast injury (4) blunt injury. Roon and Christensen1 have classified the site of cervical trauma into zone 1, 2 and 3.

1. Zone I injuries occur at the thoracic inlet. This zone extends from the level of the cricoid cartilage to the clavicles.
2. Zone II injuries are those occurring in the region between the cricoid cartilage and the angle of the mandible. Injuries in this zone are the easiest to expose and evaluate
3. Zone III injuries occur between the angle of the mandible and the base of the skull.

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According to Bailey[2] it was proposed that in early 1990, early exploration of neck injuries with tracheostomy and antibiotics reduced the mortality rate to seven per cent. Following that lots of controversies were aroused that without proper knowledge about the extent of the injury and missing an unsuspected vascular injury without preoperative angiography and oesophagoscopy was highly questioned.

But nowadays in recent time according to Demetriades et al[3] combination of clinical and selective investigations yielded a sensitivity of 100%. Hence in our patient once the patient attended emergency ward, primary survey was done. After making a clinical assessment they were immediately transferred to emergency operation theatre. Immediately we performed a tracheostomy. Airway to be secured is the most important part of management in cut throat injury. As primary survey suggested there is no major vessel injury and oesophageal injury we planned for immediate exploration of the wound.

Accuracy of the diagnosis of oesophageal injury is very important in the management of these injuries. According to Weigelt JA et al, if there are suspected injuries it is better to go for combination of oesophagography and oesophagoscopy, because they are having a sensitivity of 100 per cent[4].

The planning for repair of these penetrating neck injuries will not stop with clinical primary survey. The things that we have to do in order are first to secure intra venous line. Anaesthetists play a very important role in the management process. Under local or general anaesthesia intubation must be tried, if not possible tracheostomy must be done to secure airway, that is the most important aspect. Following securing of airway, patient should be put in proper position with neck extension only if there is no cervical spine injury. Zone 2 injuries are usually easily managed. When there is zone 1 or three injury additional surgical exposures may be needed. As both of our patients had zone two injuries, additional exposure was not required. There were no major vessel injury hence vein grafting was also not necessary. If there is suspected vascular injury we have to be also prepared for saphenous vein harvesting[5].

Our management part is not ending with the anaes the tist intervention and the surgical repair. In case of suicidal wounds proper counselling by psychiatrist plays a very important role. There are various aetiologies like schizophrenia, depression, bipolar disorder; the patient may be suffering. If after surgical intervention proper psychiatry follow-up is not done in this patient, then there are all chances of repeated suicidal attempts in these patients leading in death.

In our case both the patients were immediately taken for proper psychiatry counselling and evaluation. They were regularly followed up in the psychiatry outdoor. Not only the psychiatrist the patient's family members are also having equal responsibility, to take proper care of these patients. In our case the patient's tracheostomy was removed after 21 days and strapping was done. They recovered completely without any hoarseness of voice or vocal cord palsy. They were followed up in the 3rd month and 6th month respectively.

IV. Conclusion

Hence suicidal cut throat patients have to be monitored with proper care. When suicidal cut throat injuries occur, a multidisciplinary approach is required in the effective management of victims. This requires the close collaboration of the Otorhinolaryngologist, the anaesthesiologist and the psychiatrist. Our treatment is not ending with discharging the patient. Proper follow up is very much essential to save these patients from death.

Conflicts of Interest

The Authors Declare, There are No Conflicts of Interest.

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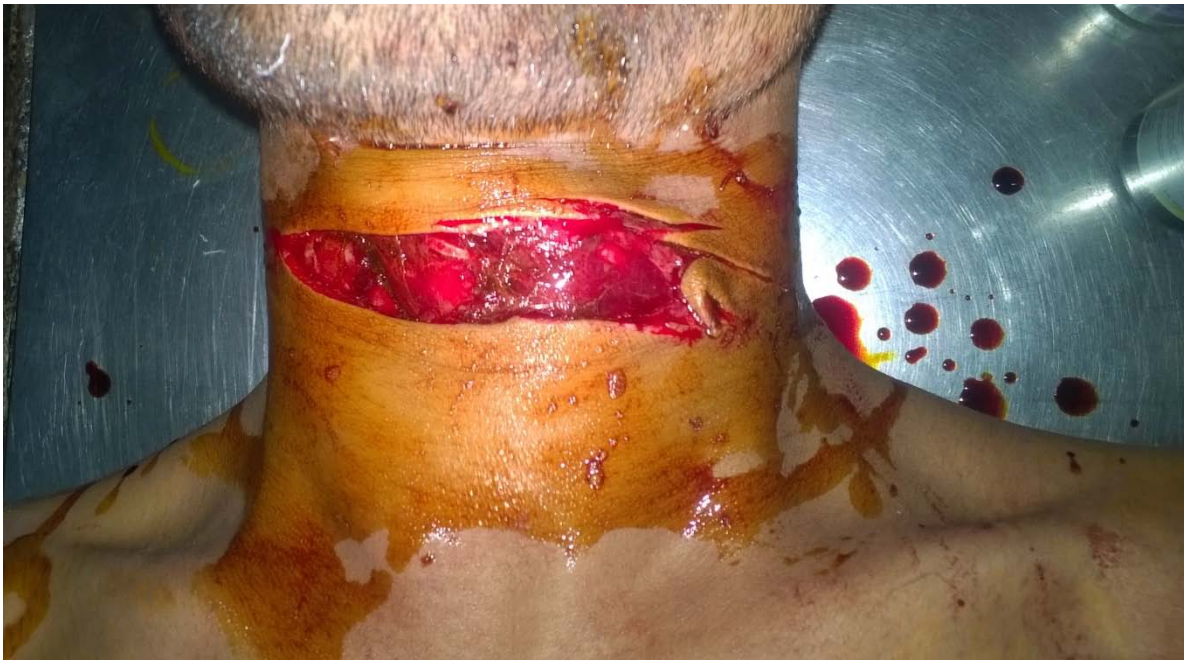

Figure 1 : Suicidal cut throat injury with hesitation cuts

Figure 2 : patient after repair day 5

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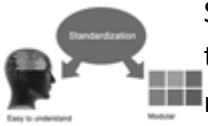

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"

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1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

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- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

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- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

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- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

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- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

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The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
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Approach

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- Give details all of your remarks as much as possible, focus on mechanisms.
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Approach:

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Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
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References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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