

The Surgical Management of Oro-Antral Fistula by Modified Rehrmann's Flap

R.K. Suryavanshi*, Neelakamal Hallur**, Kiran Raddar***, Syed Zakauallah****, Chaitanya Kothari*****, Santosh Kumar S. Mathpati*****, Vijayanath V*****

Abstract

Objective : The aim of this study was to evaluate the efficacy of Rehrmann's flap in oro-antral communication, acute and chronic oro-antral fistula along with its Critical evaluation, indications and contra-indications, complications and compare with other studies.

Study Design : In this prospective study, 20 patients with oro-antral communication, acute and chronic oro-antral fistula's, treated with modified rehrmann's flap is presented. Out of which nine cases were oro-antral communication, seven cases were acute oro-antral fistula and four were of the chronic oro-antral fistula.

Results : The successful closure of oro-antral communication, acute & chronic oro-antral fistula's were treated by modified Rehrmann's flap. Caldwell luc & intranasal antrostomy were carried out whenever indicated. recurrence was seen in one case of chronic oro-antral fistula which was carried out by palatal flap operation. One patient complained of pain two months after surgery which was treated by symptomatic treatment & one patient failed to come for the follow-up.

Conclusion : This study concludes that, modified buccal Rehrmann's flap is effective in oro-antral communication. Acute oro-antral fistula gives better results following the control of sinus infection while the chronic oro-antral fistula there can be some failures.

Key words: Oro-antral fistula; Oro-antral communication.

Introduction

Maxillary sinus is one of the largest of paranasal sinuses. The close relationship between maxillary sinus & the upper posterior teeth is an interesting subject for all oral & maxillofacial surgeons, this is because of ultra short distance between the apices of upper posterior teeth & the floor of the maxillary sinus. A common accident seen during an

extraction of upper posterior teeth is the creation of an oro-antral perforation.

A fistula may arise due to several causes like the extraction of maxillary teeth, trauma to the face, surgery of maxillary sinus, osteomyelitis of the maxilla, gumma involving the palate, infected upper implant denture and malignant granuloma.

An oro-antral fistula is defined as "an unnatural communication between the oral cavity and the maxillary antrum" depending on the duration and lining of the communication tract, it is divided into oro-antral communication, acute oro-antral fistula and chronic oro-antral fistula.

Oro-antral communication is a fresh or recently diagnosed at the time of extraction or less than 48 hrs after the extraction & is not lined by epithelium. Acute oro-antral fistula is one which is diagnosed within 14 days and is lined by epithelium, chronic oro-antral fistula

Author's Affiliation: *Principal, and Professor, **Professor and HOD, ***Reader, ****Reader, *****Asst Professor, *****PG Student, Al-Badar Dental College and Hospital, Sy. No 12, Daryapur Village Naganahalli, Near Koranti Hanuman Temple Gulbarga-585103 *****Associate Professor, Department of Forensic Medicine & Toxicology, S.S. Institute of Medical Sciences & Research centre, Davangere-577005, Karnataka.

Reprints Requests: Dr. R.K. Suryavanshi, Principal, and Professor, Al-Badar Dental College and Hospital, Sy. No 12, Daryapur Village Naganahalli, Near Koranti Hanuman Temple Gulbarga-585103.

E-Mail: suryavanshirajuk@gmail.com

(Received on 17.03.2011, accepted on 04.06.2011)

is one which is diagnosed after 14 days and is also lined by epithelium

Most of the sinus perforations may heal spontaneously but a surgical intervention is required to prevent the fistula formation. There are numerous techniques which have been broadly described as local flaps, distant flaps & grafts local flaps can be further divided into buccal flaps, palatal flap & a combination of both.

VON REHRMANN'S was the first to describe buccal advancement flap in 1936. Later in 1971 KRUGER modified the free end of the buccal flap by making a step excision of the mucosal layer which has additional advantages

1. The step preparation provides a double layer closure
2. The periosteal structure line rest on sound palatal bone.
3. Structures are at different levels (mucosal & periosteal) so that there are no chances of tissue break down.

Materials & Methods

All procedures & materials described in this prospective clinical study were treated in the department of Oral & Maxillofacial Surgery, K.L.E.S Dental College & Hospital, Belgaum.

Treatment strategy of our hospital is that oroantral acute and chronic oroantral fistulas should not be left to heal spontaneously, owing to ethical reasons.

Accordingly, twenty patients out of which nine patients with oro-antral communication, seven patients with acute oro-antral fistula & four patients with chronic oro-antral fistula were treated with Kruger's modification of rehrmann's flap.

The patients age range from 10 to 80 years with an average of 40 years out of which 13 were male & 7 female patients

Pre-operative Preparations

Patients with chronic oro-antral fistula were given warm normal saline flushing twice a day till a clear return was obtained. They were also given a palatal acrylic plate to cover the fistulous opening & were kept on antibiotic, analgesic, antiinflammatory, multivitamins, nasal drops & tincture of benzoin inhalation.

Acute cases of oro-antral communication were treated immediately.

Operative Procedure

All the patients were given intra oral rinsing with antiseptic mouth wash & local anesthesia was administered after scrubbing & draping of the patients.

Using a no.11 blade, a circular incision was given around the periphery of the fistula. The fistulous tract was held with Allis-forceps & separated with the pointed end of the Howarths periosteal elevator & dissected out. Then two divergent incisions were given from the fistulous opening on the buccal side to the depth of the vestibule. The mucoperiosteal flap was now elevated from the buccal side. Extreme care was taken not to tear adherent tissue. Elevation was then continued anteriorly and posteriorly at the flap. High & irregular alveolar process was smoothed. Tension on each side of the object was relieved by reduction of the buccal & palatal alveolar ridge. The buccal flap was mobilized by giving a horizontal releasing incision on the under surface. Care was taken to incise only the periosteum and not the mucosa, so that blood supply was not compromised.

Another incision was made perpendicular to the flap approximately 0.2cm away from the free end. This incision was limited only to the mucosal layer for at least 0.3cms. The free end of the buccal flap now consists only a very thin portion of submucosa and the periosteal layer. The width of the step excision of the free end must be sufficient enough in order to be treated under the palatal mucoperiosteum at a later stage. Then the periosteal step of the

free buccal end is pulled underneath the palatal mucoperiosteal layer by means of 2 or 3 horizontally placed mattress sutures, so that the buccal periosteum now lies underneath the palatal periosteum. The horizontal mattress sutures are held by means of hemostats. The mucosal margins of the buccal and palatal

flaps are brought into contact by pulling these horizontal mattress sutures on the palatal aspects. The anterior and posterior incisions were also closed by means of interrupted sutures. Then horizontal mattress sutures, which were held by means of hemostats are tied at this stage. This technique was combined

Fig 1: Pre-operative view



Fig 2: Incision line



Fig 3: Buccal flap reflection



Fig 4: Step preparation

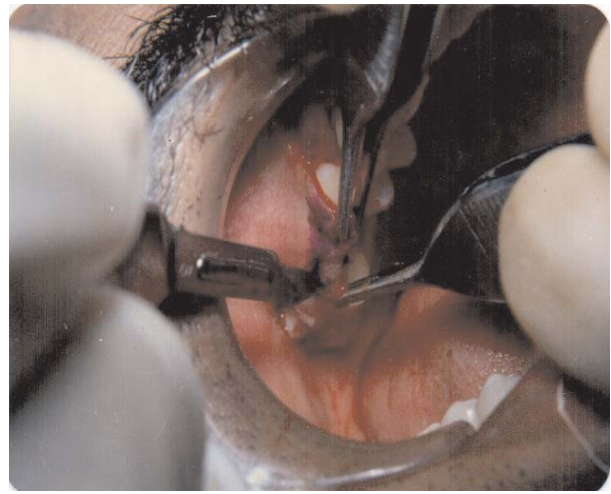


Fig 5: Sutures in position



Fig 7: Pre-operative radiograph

with the Caldwell-luc operation and intra-nasal antrostomy whenever indicated.

Discussion

Maxillary sinus has posed numerous problems to the patient and surgeon. One condition which commonly affects the maxillary sinus is oroantral communication and fistula. Numerous techniques have been described to close oroantral fistula and communication. A study was carried out to evaluate one technique of closure of oroantral fistula i.e modified Rehrmann's flap.

In this study the incidence of oroantral communication was in 9 cases(45%) acute oroantral fistula in 7 cases (35%) and the chronic oroantral fistula in 4 cases (20%).

Most common etiological factor was due to extraction of maxillary posterior teeth. Among these teeth 35% were due to extraction of second molar and 30% due to the first molar, of the remaining two cases were due to extraction of second premolar. One case each due to extraction of first premolar, third molar and impacted canine. Two cases were due to enucleation of radicular cyst associated with lateral incisor. The occurrence of oro-antral fistula was found to be more common in males than in females (2:1).

Radiological diagnosis included the intra oral periapical x-ray to rule out the presence

Fig 8: Post-operative radiograph

of root piece & foreign body in the sinus. P.A sinus view was taken for all patients. Diagnosis in all the cases were confirmed by passing a 26 gauge wire in the sinus through the oroantral fistula (or) communication and taking the x-ray.

In one case of chronic maxillary sinusitis Caldwell Luc operation was performed with enucleation of maxillary sinus lining followed by intra nasal antrostomy.

All the cases of oroantral communications were treated symptomatically with antibiotic, analgesics anti-inflammatory multivitamins, nasal drops, tincture of benzoin, inhalations depending on the condition of the sinus.

The main disadvantage that was cited with the modified Rehrmann's flap was the reduction in the buccal sulcular depth which prevented adequate retention for a future prosthesis. In this study no such problems were encountered as in all the cases the preoperative sulcular depth was achieved within 3 months.

In this study we have found that the success of closure of a oroantral fistula primarily depends not only on the flap but also on the condition of the sinus. A sinus teeming with microorganisms there is absolute certainty that there will be recurrence of the oroantral fistula. This was the prime reason why all the oroantral communications were closed with a rehrmann's flap immediately not giving any chance for infection to set in the sinus.

The preparation of the free end of the flap is the most important step, it demands the utmost patience of the surgeon. Careful splitting of mucosa and periosteum is done to achieve superior layer of epithelium measuring 2-5mm in width.

While closing two mattress sutures have to be employed to pull the buccal periosteum under the palatal mucoperiosteum. The other incision's were sutured with interrupted sutures and then the mattress suture's are tied.

Conclusion

The communication between the oral cavity and the maxillary sinus is most commonly seen after extraction of maxillary posterior teeth (1st molar 30%, 2nd molar 35%). It is more common in males than in females (2:1). It has an equal chance of occurring on both sides (left & right).

All the cases were treated by modified Rehrmann's flap, Caldwell Luc and intranasal antrostomy were carried out whenever indicated.

Follow up of the patients were continued for a period of 3 to 12 month's to see recovery of the maxillary sinus. This study concludes that, modified buccal Rehrmann's flap is effective in oro-antral communication. In acute oroantral fistula. It gives better results following the control of sinus infection while the chronic oro-antral fistula there can be some failures.

References

1. Berger A. Oroantral opening and their surgical correction. *Arch of otolaryngology* 1939 ; 30: 400-410.
2. Qurayle AA. A double flap technique for the closure of oro-nasal & oro-antral fistula. *BJOS* 1981; 19: 132-137.
3. Anderson MF. Surgical closure of oro-antral fistula. Report of series of 20 procedures. *JOS* 1969; 27: 862-863.
4. Zeidman A, Lockstuin A, Berger J & Bernard G. Repair of a chronic oro-nasal defect with an anterior based tongue flap. *JOMFS* 1988; 46: 412-415.
5. Rahman A. Foreign bodies in the maxillary antrum. *BDJ* 1982; 153-308.
6. Archer W.H. *Oral & Maxillofaical Surgery*. W.B. Saunder's co, 5th ed wl. 2, 1975; 1607-1627.
7. Ashley RE. Method of closing antro alveolar fistula. *Ann otal Rhinologyngol* 1939; 48: 632.
8. Eppley B & Sclaroff A. Oro-nasal fistula secondary to maxillary augmentation; *I.J.O.S* 1984; 13: 535-538.
9. Barton RT & Hill. Modern management of oro-antral fistulas. *Arch of Orolaryngology* 1950; 51: 678.
10. Wakesfield BG. Maxillary antrum complication in exodontia. *JOS* 1948; 6: 51-59s.