

Versatility of Modified Rehrmann Flap for Closure of Oro-antral Fistula

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ABSTRACT

Aim: The aim of the study was to identify the outcome of modified Rehrmann flap in closure of oro-antral fistula.

Material & Method: 15 patients who come under inclusion criteria were checked for fistula and confirmed clinically and radiographically. The modified Rehrmann flap was used and follow up was carried out every month for six months.

Results: out of fifteen patient, breakdown of flap was occurred in one patient. Rest of the patients had good result in condition of flap.

Conclusion: Modified Rehrmann's flap coupled with caldwell-Luc operation and inferior meatus antrostomy gives 94.44% of success rate in closure of oro-antral communication.

Keywords: Oro-antral communication, Modified Rehrmann flap, infection.

INTRODUCTION

The epithelised communication between the antrum of Highmore and the oral cavity – The Oro-antral fistula is an unfortunate, unforeseen and at times unavoidable complication of routine exodontic procedures. No doubt close approximation of the roots of the molars to maxillary sinus increases the risk of oro-antral fistula, yet the operator is equally responsible for this mishap. Successful treatment such communication has been a challenge to surgeons, more so to oral and maxillofacial surgeons. The treatment not only calls for an early surgical intervention, but also expertise to avoid failures. Various techniques have been tried from time to time and new ones are being evolved. It remains a moot point as to which technique is more reliable, easiest and free of complications. Another point of dispute is the necessity of performing nasal antrostomy, and if so, at what level. This study

attempts to evaluate the suitability of modified Rehrmann flap technique in the management of oro-antral fistula.

MATERIAL AND METHOD

The patients included in this study are those who reported to the Department of Oral & Maxillofacial Surgery, Govt. Dental College and Hospital, Ahmedabad, Gujarat. Total 15 patients included in this study. Out of them, 12 patients were operated under general anesthesia and 3 patients were operated under local anesthesia. The plastic closure of the fistula starts with the excision of the fistulous tract. A deep circular incision is taken around the periphery of the fistula with the help of Bard Parker blade No. 11. The entire depth of the fistulous tract is separated with the pointed end of the Howarth's periosteal elevator, caught with a pair of Allis forceps and removed without breaking its continuity (Figure 1). On the buccal aspect, from

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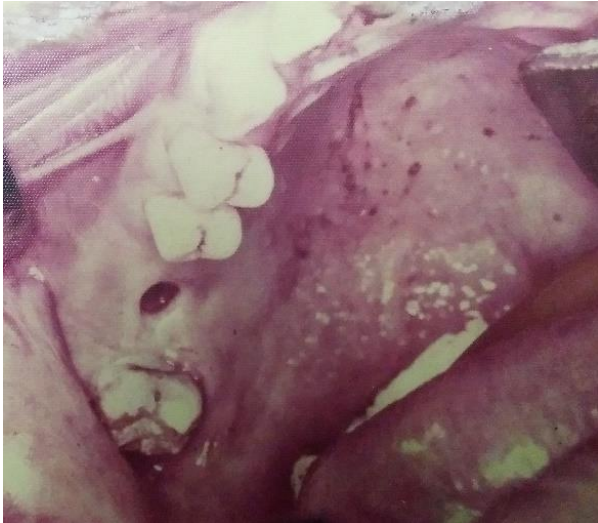


Fig 1: Oro-antral communication on right side maxillary first molar region.



Fig 2: Modified Rehrmann flap with surgical window in the anterior wall of maxillary sinus.

the fistulous opening two divergent incisions are taken up to the depth of the vestibule and are made further divergent upwards, extending anteriorly up to the level of incisors, and posterior one up to the second molar tooth. This serves two purposes:

- 1) It provides a wide base to the buccal flap.
- 2) The site for Caldwell-Luc operation (canine fossa) is also exposed.



Fig 3: Mattress and Interrupted sutures in position.

The mucoperiosteal buccal flap is reflected almost up to the level of infraorbital foramen with the help of Howarth's periosteal elevator. Great care is taken not to traumatize this mucoperiosteal flap. The canine fossa, lateral to the canine eminence, is visualized. A circular surgical window approximately of 1.00 to 1.50 cm. in diameter is carved out with the help of an acrylic trimmer (vulcanized bur). Care is taken not to extend this surgical window higher up, lest the infraorbital neurovascular bundle is injured (Figure 2).

This surgical window which leads into the maxillary sinus, should be sufficient enough to allow the entry of a large curette. The diseased lining is stripped off and removed with the help of a curved haemostat. Possible curettage of sinus is also done with the curette. The root piece or foreign body if present, is also searched out. The sinus is flushed with normal saline and bleeding, if present, is arrested. The buccal flap is mobilized freely by giving a relaxing incision in the periosteum on the under surface of the mucoperiosteal flap. To achieve this, a horizontal cut is made through the periosteum of the buccal flap, high up in the alveolar sulcus and is carried all the way through on one movement. Care is taken to incise the periosteum only, so that there is no injury to the blood vessels.

The most important step of this method is the preparation of free end of the buccal flap. The free end is held along its breadth with the help of a pair of Irish dissecting forceps and the mucoperiosteal flap is split horizontally with blade no. 11, into mucosal and periosteal layers, approximately up to the depth of 1.00 cm. About 5.00 to 8.00 mm. of the mucosal layer is excised out, thereby creating a step. The free end of the buccal flap now consists of periosteum only (thin portion of submucosa and periosteum). The palatal mucoperiosteum is undermined near the fistulous opening. Before finally closing the fistula, inferior meatus nasal antrostomy is performed at this stage. While packing the sinus, great care is exercised not to pack the sinus on the medial postero-superior aspect as the optic foramen lies there. The antrum is packed layer by layer to facilitate easy removal of the pack subsequently.

The periosteal layer of the free buccal flap is dragged underneath the palatal mucoperiosteum by means of two or three horizontal mattress sutures, so that it comes to lie underneath the palatal mucoperiosteum. The horizontal mattress sutures, however, are not tied at this stage, but are held with Halstead's mosquito forceps. Buccal incisions and palatal mucoperiosteum with the buccal mucosal step are sutured with 30 black silk, and then it is followed by knotting the horizontal mattress sutures on the palate (Figure 3).

Table 1: Vitality of teeth chart

No.	Gender	Age	Type of Fistula	Type of Anesthesia	Sinus Packing	Histopathology of Sinus Lining	Result
1	Female	50	Chronic	General	Packed	Chronic Inflammation	Success
2	Male	25	Chronic	General	Packed	Chronic Inflammation	Success
3	Male	40	Chronic	General	Packed	Chronic Inflammation	Success
4	Female	28	Chronic	General	Packed	Chronic Inflammation	Success
5	Male	63	Chronic	General	Packed	Chronic Inflammation	Success
6	Female	45	Chronic	General	Packed	Chronic Inflammation	Success
7	Male	28	Chronic	General	Packed	Chronic Inflammation	Failure

A rigid regime of following instructions was followed by the patients:

- 1) Soft diet to trauma and contamination of the area.
- 2) A sincere attempt to avoid sneezing, excessive laughing, coughing, etc.

So that there is no pressure in the sinus. Antral pack was removed after 72 hours and Otrivin nasal drops was continued for two months. Interrupted sutures were removed approximately after seven days and mattress sutures after ten days. Follow-up was carried out every month for six months period post operatively.

RESULTS

Post-operative clinical and radiological assessment was made in each case. Primary closer was achieved in fourteen patients. Failure of flap was noticed in one patient after two months. Regurgitation of fluid through nostril was absent in all cases.

Marked loss of mucobuccal depth was noticed for the first two months, but vestibular depth became nearly physiological after four months. No case was seen with permanent paresthesia of upper lip and upper gingiva. Vitality of teeth were present in all the cases (Table 1)

8	Female	60	Chronic	General	Packed	Chronic Inflammation	Success
9	Male	50	Chronic	General	Packed	Chronic Inflammation	Success
10	Male	12	Chronic	General	Not packed	Cystic Lining	Success
11	Male	24	Chronic	General	Packed	Chronic Inflammation	Success
12	Male	40	Acute	Local	Packed	Cystic Lining	Success
13	Male	25	Chronic	General	Packed	Chronic Inflammation	Success
14	Male	23	Chronic	Local	Packed	Chronic Inflammation	Success
15	Male	40	Chronic	Local	Packed	Chronic Inflammation	Success

DISCUSSION

An oro-antral fistula is an opening that joins the maxillary sinus to the oral cavity and is epithelised⁵. This condition is usually associated with acute or chronic maxillary sinusitis of some degree. Common etiological factors are the extraction of maxillary teeth which is sometimes unavoidable¹, massive trauma to the face, surgery to the maxillary sinus, osteomyelitis of the maxilla and infected upper implant dentures. In this study, most of the cases resulted following extraction of maxillary teeth and the extraction of first molar tooth is the most common site 48% ^{2,3}. According to Norman⁴, major cause of the fistula is extraction of teeth (80%) and next in order is fracture of the tuberosity (20%). Two out of fifteen patients reported with dental cyst. Subsequent removal of the cyst lead to an oro-antral fistula. This etiological factor was noticed by Steve & Karl⁶ and Ziemba⁷.

Oro-antral fistula is common on left side² probable reason being that the left side extraction is more difficult for a right handed operator. Thus the explanation given by the authors seems to be more logical rather than practical. They have also mentioned that fistula are more common in males than in females. Same has been observed in this series of cases and the ratio is 3:1 with predominance of males over females (Table 1). The fistula is less common in children as the antral cavity is not developed completely up to fifteen

years of age³. In our study, oro-antral fistula was found in a child patient aged twelve years. For acute fistula, IOPA is diagnostic to rule out the root piece trapped in between the extraction socket and the lining of the maxillary sinus. 15 degree occipitomental view should be taken for chronic fistula. This view, in addition to localising the tooth or part of tooth, will also show the condition of maxillary sinus. Presence of root piece in three, out of fifteen cases was confirmed in this series. For confirmation of chronic fistula, sinography was used by Arththur⁸. He used lipodol dye for sinography. In our series, demonstration and confirmation of fistula was established by pushing a 21 gauge wire from socket to the sinus and a postero-anterior view if sinus was taken.

Many types of surgical techniques have been advocated from time to time for closure of an oro-antral fistula. The surgical procedure serve two main purposes:

- 1) Covers the fistulous opening permanently
- 2) Prevents and control the sinus infection

Von Rehrmann pioneered the buccal flap operation techniques to close an oro-antral fistula. The base of the flap is kept broader for adequate blood supply. To guarantee the success, this buccal flap was modified by kruger, E.⁹. This modification is only confined at the free end of the flap. With this modification, there is double security to the flap.

The tough buccal periosteum fuses with the palatal periosteum and also adheres to the palatal bone firmly, this establishes the continuity of the flap over fistula. The only possible disadvantage of the buccal flap is the shallowing of the buccal vestibule initially, but this does not stay long.

However, in all fifteen cases modified Rehrmann flap technique with Caldwell-luc operation and inferior meatus antrostomy was carried out. The antral pack used was a ribbon gauze impregnated with acriflavine and glycerine in a ratio of 2:1; and after removal of the pack all the patients were put on a fixed regime of treatment:

- Continuation of antibiotics for 5-7 days
- Nasal decongestant
- Tincture Benzoin compound inhalation.

CONCLUSION

Almost all patients reported with a long standing fistula and so the line of treatment used in this series is modified Rehrmann's flap coupled with Caldwell-Luc operation and inferior meatus antrostomy with 94.44% success. In only one case the breakdown was noticed due to infection. The follow-up of the operated patients was continued for six months to see the condition of the sinus. No gross infection of the sinus was observed.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

- 1) Dewey AR, Surgical involvement of the maxillary sinus. Dent Clin North Am. 1965 Nov;691-701.
- 2) Jones EH, Steel JS. Roots in the maxillary sinus., Aust Dent J. 1969 Feb;14(1):8-11.
- 3) Reading P, Harrison DF, Dinsdale RC. The causation, pathology and treatment of oro-antral fistula resulting from dental extraction., J Laryngol Otol. 1955 Nov;69(11):729-43.
- 4) de Norman JE, Craig G., Oro-antral fistula. An analysis of 100 cases, Oral Surg Oral Med Oral Pathol. 1971 Jun;31(6):734-44.
- 5) Fredrics HJ, Scopp IW, Gerstman E, Morgan FH., Closure of oroantral fistula with gold plate: report of case, J Oral Surg. 1965 Nov;23(7):650-4.
- 6) Cockerham S, Wood WH, Lind K., Closure of a large oroantral communication by bone grafting, J Oral Surg. 1976 Dec;34(12):1098-1100.
- 7) Ziemba RB, Combined buccal and reverse palatal flap for closure of oral-aJ Oral Surg. 1972 Oct;30(10):727-9.
- 8) Eastman AD., Tooth in the maxillary sinus: report of case, J Oral Surg (Chic). 1958 May;16(3):254-6.
- 9) Krüger E., Closure of mouth-antrum perforations, Quintessence Int (Berl). 1971 Jan;2(1):11-6.