

Use of Two Flap Palatoplasty for Closure of Oro-Nasal-Fistula by Trauma Sequel: Case Series and Review of Literature

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Abstract:- The Oro-nasal-fistula is a complication of maxillofacial trauma, even when the trauma is managed with proper protocol. The palatal bone is relatively thin and it has weak bony support from the adjacent bone, which leads to increase chances of postoperative complications such as fistula formation. The management of palatal fistula depends on the size, site, and mode of presentation. The two flap palatoplasty technique is used in cleft patients for decades. This is simple, effective with good healing of raw site and there is less chance of recurrence. Palatal fistula can be treated by many methods, but only a few articles are published in which fistula as a sequel to trauma is described. Here the authors present 4 cases of Oro-nasal-fistula, which were successfully treated by two flap palatoplasty techniques. The authors also briefly review every aspect and implication of this technique.

Keywords:- Two Flap Palatoplasty, Palatal Fistula, Oro-Nasal-Fistula, Sequel Of Maxillofacial Trauma, Case Series.

I. INTRODUCTION

An Oro-nasal-fistula is a chronic, abnormal, epithelialized communication between the oral cavity and the nose. Oro-nasal-fistula is an uncommon presentation in day to day clinical practice except in some cleft patients^[1]. The rate of Oro-nasal-fistula varies from 4-35 %^[2]. The location and size of the fistula are variable and it can result due to trauma, infections, neoplasia, surgical repair of cleft palate, etc.

The postoperative complications after treatment of any trauma, even after following all the basic principles and proper protocol range from 1-1.5 %^[3]. These complications may occur on soft as well as hard tissue. The early postsurgical soft

tissue complications are infection, flap dehiscence, or necrosis, and if the significant infection persists, can lead to a permanent fistula. The fistulae which occur due to trauma are sometimes located in the soft palate but more frequently in the hard palate. The two main symptoms related to the Oro-nasal-fistula are nasal regurgitation and speech problems. Repair of Oro-nasal-fistula depends on its size, site, and mode of presentation^[4].

A variety of surgical procedures for the repair of Oro-nasal-fistula have been suggested using a number of regional and distant soft tissue free flaps. Local flap and 2 flap palatoplasty are the common techniques used for the closure of the Oro-nasal-fistula. This surgical procedure is simple and provides a definitive repair with the least morbidity.

Though, in cleft patients, the two flap palatoplasty technique is successfully used for decades and sufficient articles narrate that. Palatal fistula is treated by many methods, only a few articles are published which are the sequel of trauma and are treated by two flap palatoplasty technique. In this article, the author presents a case series and also briefly reviews every aspect, and implication of this technique.

II. CASE SERIES:

This article describes a case series of 4 patients who were operated on in the Department of Oral and maxillofacial surgery in the Government College of Dentistry Indore, (M.P, India), for Oro-nasal-fistula, caused due to traumatic sequel. The details of the patients are as follows:

A. *Case 1:* A 45-year male reported in the department with a chief complaint of a hole within the palate, with a history of maxillofacial trauma due to an event of a road traffic accident (RTA) 1.5 years ago. [Fig 1-a]

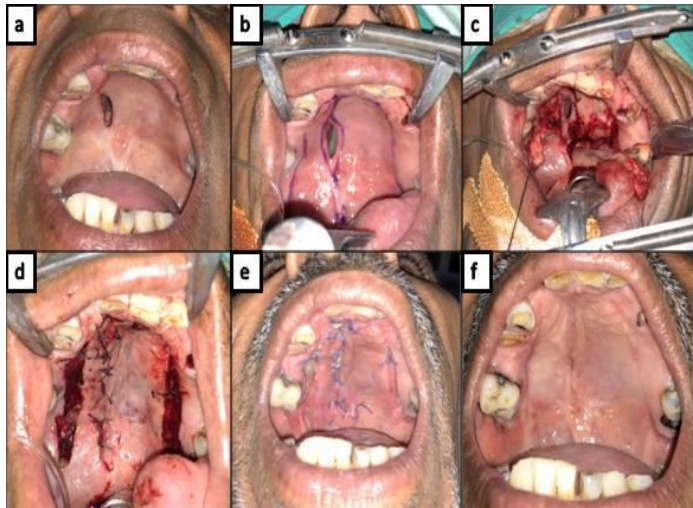


Fig 1: [a] Pre-operative image, [b] Planned incision, [c] Flap Elevation, [d] Closure, [e] Post-operative 1st week, [f] post-operative 4th week

B. *Case 2:* A 23-year male patient reported in the department with a complaint of nasal regurgitation and hypernasality of voice for 8 months giving a history of maxillofacial trauma due to an event of RTA, treated for the same somewhere else. [Fig 2a]

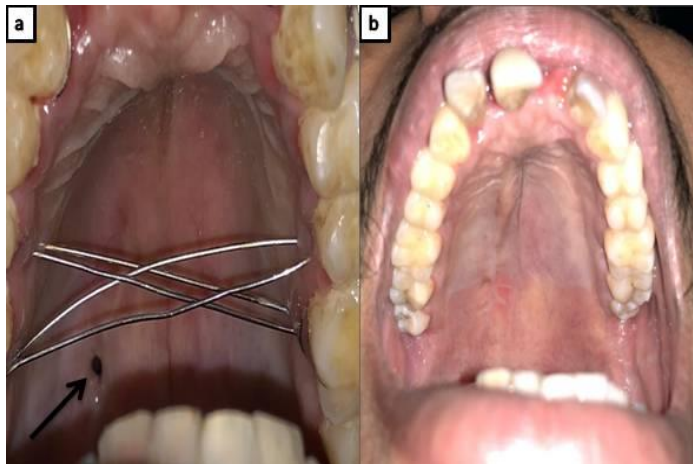


Fig 2: [a] Pre-operative image, [b] Post-operative image

C. *Case 3:* A 49-year male patient, reported a complaint of unable to eat and drink properly, and when he ate all came out through the nose. He had a history of treatment in our department for Le-Fort 1 maxilla fracture with palatal split, 5 months ago. [Fig 3a]

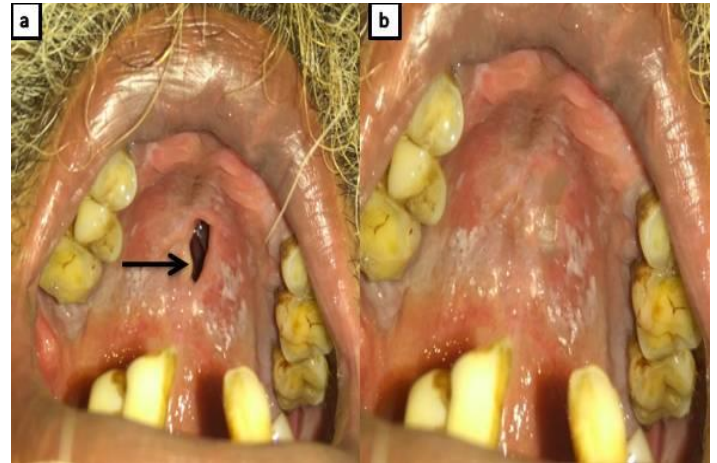


Fig 3: [a] Pre-operative image, [b] Post-operative image

D. *Case 4:* A 35-year female reported a foul-smelling and bad taste from palate for 7-8 months with a history of assault by a blunt object. [Fig 4a]

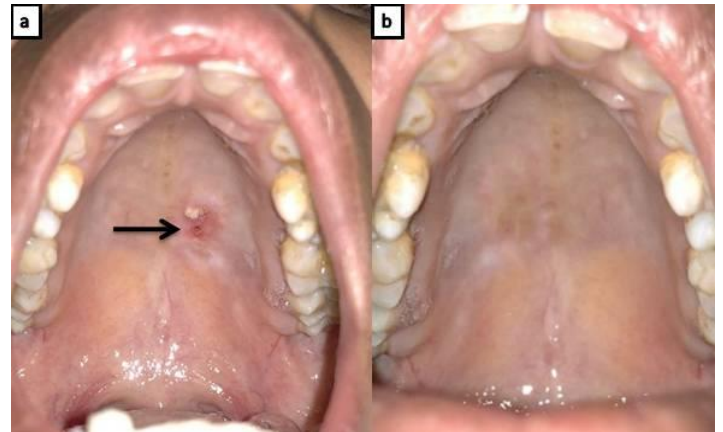


Fig 4: [a] Pre-operative image, [b] Post-operative image

On general physical examination, all patients were well oriented with time, place, and person and all vitals were within the normal limits. Intraoral examination of all the 4 patients, showed an Oro-nasal-fistula in the hard palate measuring 1.5 x 0.7 cm on the right side, 1.2 x 0.5cm on the right side, 1.3 x 0.6 cm on the mid-palate, 0.8 x0.5 cm on the left side, respectively.

All the Oro-nasal-fistulae showed no signs of infection and inflammation and were present with the healthy surrounding tissue. In cases 1, 3, and 4, provisional treatment was done with a palatal obturator for 2-4 months, and in case 2 we used trans-palatal wiring because he had a recent history of trauma. After discussing in detail the possible treatment options and considering the patient’s general condition, age, and interest, complete closure was planned by two flap palatoplasty technique.

The closure of the Oro-nasal-fistula was performed under General Anesthesia with nasotracheal intubation. The palate was infiltrated with lidocaine and epinephrine (2% and 1: 200000) to achieve hemostasis. A standard Bardach closure was performed in all patients. In this technique, the first oral and nasal mucosae are incised on each side of the fistula, later the second full-thickness mucoperiosteal flaps were elevated from the lateral side of each palatal shelves. The second incision is connected with the anterior extent of the previous incision. When a full-thickness mucoperiosteal flap is elevated, care must be taken to preserve the greater palatine vascular pedicle. A watertight closure was performed first in the nasal mucosa, then second in oral mucosa, with 4-0 (2465) vicryl suture. Finally, each mucoperiosteal flap is loosely tucked back to its original location^[5] [Fig 1 b-d].

After complete closure and hemostasis were ensured, the patients were instructed for proper oral hygiene care with saline mouthwash rinse. Feeding was carried out by Ryle's tube for the first 3 days. Later semi-solid feeding was continued for at least 15 days. The patient was instructed not to forcefully sneeze, whistle, or blow from the mouth. On the 15th day of patient recall, we found that the palatal fistula in all the patients healed successfully with no postoperative complications, such as bleeding, hematoma, congestion, infection, flap necrosis, or flap detachment [Fig 1e]. All the patients were later followed up for a period of 1.5 to 2 years and no recurrence of the fistula was noted. [Fig 1f, 2-4b]

III. DISCUSSION

Oro nasal communication is a pathological connection between the oral cavity and the nasal cavity. The fistula is outlined as an epithelial lined tract connecting two cavities. The etiology of Oro-nasal-fistula may be congenital or acquired. The congenital causes may be cleft or syndromic. The acquired causes are trauma, local & systemic infection, neoplasm, post-operative complications of cleft repair, etc. The most common clinical feature is the escape of fluid through the nose, the other features include hypernasality, defective speech, fetid odor, and bad taste may be present.

In 1992, *Rimsell* presented a retrospective study of 19 palatal fractures treated by closed reduction. Out of 19 cases, 1 patient had developed Oro-nasal-fistula^[6]. Similarly, *Chen et al* in 2008 studied 162 cases, out of which 3 cases which were communicated palatal fracture (type III), had developed Oro-nasal-fistula^[7]. Evidence indicates that, because of the lack of bony support and weak palatal bone, the treatment is challenging in patients with comminuted palatal fracture which leads to collapse and cicatricial loss of soft tissue volume. The most frequently encountered primary complications after treatment of a traumatic case are infection and soft tissue flap dehiscence, and if significant infection persists can lead to the permanent fistula. In this sense, if the maxillofacial fracture is treated within time with primary

closure of mucosa or soft tissue simultaneously, may avoid postoperative complications such as fistula or others.

Management of Oro-nasal-fistula depends on the size and site of the fistula. The definitive management is always surgical^[1]. Single-layer closure techniques are less reliable and are present with the shortage of tissue, compromised vascularity, the fragility of repair, and more probabilities of failure. The use of a small rotation flap with a hinged flap creates a mass effect because the flaps overlap each other. Apart from this, the movement of the small rotated flap is limited and circulation is troublesome. From these, buccal and tongue flaps need a minimum of two surgical stages^[8]. Taking tissue from another donor site or distant flaps causes some sensory deficits that will preferably be avoided by using local flaps to these complicated techniques. Two-layered closure provides greater support and stability and reduces the chance of failure. This technique is simple, effective with good healing of raw site and there are fewer probabilities of recurrence.

The two flap palatoplasty provides a two-layer and three-layer closure of the whole palate^[9]. The main advantage of the Bardach two flap palatoplasty technique is that it is carried out in a single step surgery whereas the main disadvantages are denuded bone on the lateral side, which causes discomfort. The most common complication of this technique is velar insufficiency if the defect is located at the junction between the hard and soft palate^[10].

However, the recurrence rate of two flap palatoplasty is low, in case of recurrence noted in any of these patients we can be repeated or search for any suitable alternative procedure that may be performed. We recommend that the study should be done in a large sample size and long follow-up duration.

IV. REVIEW OF LITERATURE

B. J. Wilhelmi et al 2001 reviewed 119 consecutive cleft-palate repairs with the two-flap palatoplasty technique. They concluded that the two-flap palatoplasty technique was used to provide tension-free, multilayer repairs, with less complication rate^[11].

Kenneth E. Salyer et al 2005 reviewed 382 two-flap palatoplasties performed by the senior author in non-syndromic patients over 20 years and stated that the two-flap palatoplasty is a reliable technique that has yielded excellent surgical and speech outcomes^[12].

Ananth S. Murthy, et al 2009 reviewed 332 children with non-syndromic cleft palate who underwent 2-flap palatoplasty. Eight children (2.4%) were found to have fistulae postoperatively and concluded that the two-flap palatoplasty is a highly successful technique for the closure of a variety of palatal clefts, with low fistula incidence^[9].

M. T. Fonseca Oliveira et al 2011 presented a case report of oronasal fistula as a consequence of facial trauma that was treated by two flap palatoplasty and they concluded that the two flap palatoplasty is a relatively simple option that can provide definitive repair with minimal morbidity^[13].

Emmanouel Koudounnakis et al 2012 reviewed a total of 257 cleft children treated with two flap palatoplasty. There were 19 cases (5.4%) of fistula that occurred as a complication of this procedure and they further concluded that two-flap palatoplasty is an effective procedure but warrants further attention^[14].

Muhammad Aslam 2015, presented a case series of 90 Cleft palate, who were repaired by two-flap palatoplasty, and concluded that the complications due to two-flap palatoplasty technique for repair of cleft palate was uncommon (5.6%) provided the repair was tension free and multi-layered^[15].

Alwaleed Khalid Alammam et al 2018 reviewed a total of 29 non-syndromic patients who underwent two-flap palatoplasty for cleft palate repair and stated that the two-flap palatoplasty is a reliable technique with excellent surgical and speech outcomes^[16].

V. CONCLUSION

Oro-nasal-fistula has multifactorial etiology, of them maxillofacial traumatic sequela are completely different and this may affect the lifestyle of patients. Oro-nasal-fistula is treated by several techniques and each technique has its advantages and drawbacks. If the benefits are more viz then we try to do the best technique. In this sense two flap palatoplasty is relatively simple, reliable that can provide a definitive repair with minimal morbidity and the least chances of recurrence.

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