

Nasolabial flap in oral sub mucous fibrosis - Our experience and review

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Abstract: *Background & Objectives:* Oral submucous fibrosis (OSMF) is a pre-malignant condition which results in progressive closure of the mouth. Management is predominantly in the realm of surgery. The procedure consists of releasing of all the buccal fibrotic bands followed by reconstruction of the defect. From among the various reconstructive modalities available, the nasolabial flap is the most versatile attributed to its reliable vascularity and offers itself as an attractive option for reconstruction of regional intraoral defects. In our study, we evaluate the effectiveness of the nasolabial flap in the reconstruction of the defect created after releasing of the fibrotic bands in patients with oral submucous fibrosis. *Methods:* 12 cases of oral submucous fibrosis who reported to the Department of Oral and Maxillofacial Surgery, MIDSR, Dental College and Hospital, Latur were selected in this study and treated with surgical releasing of fibrotic bands and reconstruction of the resultant defect with nasolabial flap. *Results:* No case of wound dehiscence or necrosis, obstruction of Stenson's duct, damage to facial artery and facial nerve branches were observed post operatively. The postoperative mouth opening was 20-40 mm (Mean: 36.416 mm) after 6 months follow up and the mean increase was 24.916 mm. The only notable complication was intraoral hair growth in some patients. *Interpretation & Conclusion:* The results of our study have led us to the conclusion that the nasolabial flap offers itself as an effective and predictable modality of reconstruction in cases of OSMF.

Keywords: Oral Submucous Fibrosis, Trismus, Nasolabial Flap.

Introduction

Oral Sub mucous fibrosis (OSMF) which presents with a severe degree of trismus remains a difficult surgical problem. Several procedures have been tried in the past to relieve the trismus such as local injections of Steroids, Hyaluronidase, Human Placental Extract, Chymotrypsin, Multivitamin therapy, Physiotherapy as medical management and as surgical management the excision of fibrotic bands and repair of the resultant defect with either split thickness skin graft harvested from patient's thigh, a single layer of fresh Amnion obtained from clean vaginal delivery of serologically normal women, buccal fat pad graft or nasolabial flaps [1-2].

The nasolabial flap is an arterialized local flap in the head and neck region with an axial blood supply provided either by facial artery (inferiorly

based) or by superficial temporal artery through its transverse facial branch and the infraorbital artery (superiorly based). It is used in variety of situations including reconstruction of lower eyelid, defects of nose, floor of the mouth, tongue, buccal mucosa and palate [3].

In our study we used the nasolabial flap for the reconstruction of the defect created after releasing of the fibrotic bands from the buccal mucosa in the patients with OSMF.

Aims and Objectives: To evaluate the effectiveness of Nasolabial flap as a modality of reconstruction in treatment of oral sub mucous fibrosis and evaluation of the long term mouth opening after the surgical treatment of OSMF using Nasolabial flap.

Material and Methods

This study was carried out in the Department of Oral & Maxillofacial Surgery, MIDSR, Dental College and Hospital, Latur. Twelve patients fulfilling the inclusion criteria were undertaken for this study under GA. The clinical and functional staging of the disease was determined according to the criteria given by the Haider and Merchant [4].

Inclusion Criteria:

1. Male patients between age group of 18 years to 48 years.
2. Pre operative mouth opening less than 15mm
3. Patients giving history of arecha nut/gutkha chewing of minimum 5 years.

Exclusion Criteria:

1. Female patients
2. Patients with temporomandibular joint problems
3. Pericoronitis of the lower third molars.
4. Patients who had recieved medical treatment like intralesional steroids, mulivitamins etc

Methodology: Pre operative mouth opening was measured. (Figure 1) After intubation intraoral incision was given using electrosurgical knife parallel to occlusal plane on the buccal mucosa to release the fibrous bands taking care of Stenson's duct orifice. Incision began from the angle of mouth to the retro molar trigone. The bands were further freed by finger dissection and undermining was done by blunt dissection until no resistance was felt. Using Fergusson's mouth gag forced mouth opening of 40mm was achieved [5].

Fig-1: Pre operative mouth opening



In those, cases where we were not able to achieve satisfactory mouth opening after releasing of fibrotic bands, additional procedures like coronoidectomy and temporalis myotomy were contemplated. The periosteum of the anterior part of the mandibular ramus was elevated with ramus retractor and subperiosteal dissection was continued up to the sigmoid notch with the help of curved periosteum elevators. Two elevators were placed on each side of the Coronoid process to protect important structures, including the lingual and inferior alveolar nerves, the maxillary artery with its branches and accompanying veins. After isolation of Coronoid process, temporalis myotomy or coronoidectomy was done [6].

Fig-2: Resection of fibrotic bands



Mandibular movements were checked in all directions to rule out temporomandibular joint movement problems owing to prolonged trismus. For the reconstruction of the defect created in the buccal mucosa, the nasolabial flap was used. The design of the flap to be raised was first marked on skin of the nasolabial region (figure 2).

The underlying facial artery was identified beneath the facial skin with assistance of its anatomical landmarks. The width at the base of the flap was kept as 1.5 cm to 2.5 cm and length was 5 cm to 8 cm. The medial and lateral limbs of incision tapered together superiorly approximately 2 cm to 2.5 cm antero-inferiorly to medial canthus. After this, the flap was raised from superior to inferior in a supramuscular plane by using dissecting scissors (figure 3) and a transbuccal tunnel was created with Metzenbaum scissors at the

level of the lateral commissure of the mouth (figure 4). The transbuccal tunnel was large enough to easily accommodate 1 or 2 fingers (1.5 to 2.0 cm) [7].

Fig-3: Pre surgical marking of nasolabial flap



Fig-4: Flap elevation



The flap was then transferred into the oral cavity in a tension free manner and closure was done with simple interrupted sutures using 3-0 absorbable vicryl (figure 5). For better adaptation and stabilization of the flap, a transbuccal stay suture was passed. Layered closure of the donor defect was then performed using 3-0 vicryl suture for deeper layer and 5-0 prolene for final skin closure (figure 5). Dressing was done with paraffin impregnated tulle grass (Cuticell) to promote moist healing and reduce sticking (figure 6).

Fig-5: Flap tunneled into the mouth



Fig-6: Flap sutured to the margins of the defect intra orally



Patients were advised to apply a topical Allantoin, Cepae and Heparin preparation (Contractubex gel) 3-4 times daily for 3 months to minimize the scar. Patients were put on nasogastric tube feeding for duration of 21 days. Extra oral sutures were removed by the end of seventh day and by the end of the fifteenth day all the intraoral sutures were removed. Mouth opening exercises (using Heister jaw opener) were started from the 2nd post operative day for at least half an hour in the beginning, later the frequency and duration was increased to facilitate improvement in the mouth opening until the satisfactory mouth opening was achieved [5].

Fig-7: 6th month post operative mouth opening



Follow up of 6 months was done and mouth opening measured. (Figure 7).following parameters were checked and tabulated in all cases:

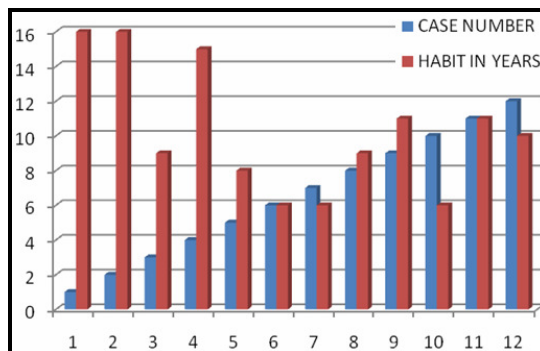
- History of habit-frekuensi and duration
- Healing of donar and recipient site
- Wound/flap infection
- Increase in mouth opening
- Intra oral hair growth

Results

The Habit history showed all the patients had recently chewed areca nut in one or the other form (Gutkha, Mava, Pan Masala etc.). Two

patients also had the habit of smoking and alcohol. The frequency and duration of the habit was in the range of 5 to 20 times per day and 5 to 15 years respectively (Graph-I).

Graph-I: Habit history in years

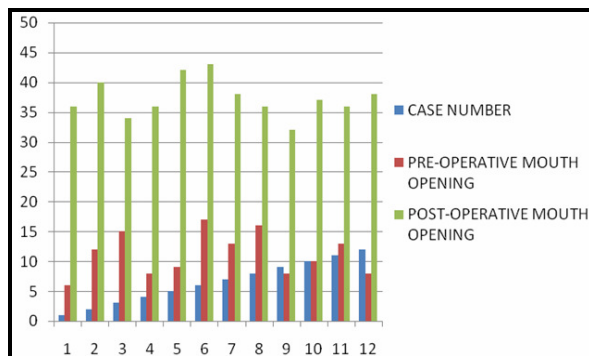


All the patients were evaluated post operatively for healing of the donor and recipient site. In the early post operative period, sloughing at the recipient site was noted in five cases. Extra oral healing at the donor site was uneventful in all the cases except in one case where an orocutaneous fistula developed. The flap got infected in two cases two weeks after the surgery. Other complications such as flap loss, flap avulsion, obstructive sialadenopathy or wound dehiscence were not encountered in any of our cases (Table-I).

Table-I: Post-operative complications

Case No	Intra oral hair growth	Sloughing	Infection	Orocutaneous fistula	Obstructive sialadenopathy	Wound dehiscence	Flap necrosis	Hypertrophic scar
1	NO	NO	NO	NO	NO	NO	NO	NO
2	YES	YES	NO	YES	NO	NO	NO	NO
3	NO	NO	NO	NO	NO	NO	NO	NO
4	NO	YES	NO	NO	NO	NO	NO	NO
5	NO	NO	NO	NO	NO	NO	NO	NO
6	YES	YES	YES	NO	NO	NO	NO	NO
7	NO	NO	NO	NO	NO	NO	NO	NO
8	YES	YES	YES	YES	NO	NO	NO	NO
9	NO	NO	NO	NO	NO	NO	NO	NO
10	YES	YES	NO	NO	NO	NO	NO	NO
11	NO	NO	NO	NO	NO	NO	NO	NO
12	NO	NO	NO	NO	NO	NO	NO	NO

Graph-II: Pre-operative and post-operative mouth opening



Although the scars were perceptible in all the cases, they were readily accepted by the patients. The postoperative mouth opening was in the range 20-43 mm (Mean: 36.416 mm) over a follow up period of 6 months. The average increase of the mouth opening was in the range of 12-32 mm (Mean: 24.916 mm) (Graph-II). In four of our cases we were not able to achieve satisfactory mouth opening after releasing of fibrotic bands. In those cases, we performed additional procedures like coronoidectomy in two cases and temporalis myotomy in another two cases. Intra oral hair growth was observed in 4 patients.

Discussion

Oral submucous fibrosis has been reported almost extensively among Indians living in India and among other Asiatics, with a reported prevalence ranging upto 0.4% in Indian rural population. Epidemiological and in vitro experimental studies have shown that chewing areca nut is the major etiological factor for oral submucous fibrosis [8].

The reasons for the rapid increase of the disease are reported to be due to an upsurge in the popularity of commercially prepared areca nut preparations (pan masala) in India and an increased uptake of this habit by young people due to easy access, effective price changes and marketing strategies [9]. Patients suffering with this condition complain of burning sensation on eating spicy food, hot food or on intake of hot beverages, nasal regurgitation or nasal intonation [9-11]. Clinically, the disease is characterized by blanching and stiffness of the oral mucosa, trismus and a burning sensation in the mouth. The striking features are limited mouth opening and

diffuse or discrete bands of dense subepithelial fibrous tissue [7]. The fibrotic bands in the buccal mucosa run in vertical directions, in the soft palate the fibrous bands radiate from the pterygomandibular raphe or the anterior faucial pillars and in the lips circular bands can be felt around entire rima oris [12].

A wide range of treatments have been proposed to alleviate the signs and symptoms of the disorder such as medical management, surgical management and physiotherapy [2, 13]. Medical management includes Local and systemic use of betamethasone and various multivitamins [1]. Submucosal injections of triamcinolone acetonide, hyaluronidase, dexamethasone alone or in combination with hyaluronidase and/or placental extract but the improvement achieved is not substantial enough to give the patient any relief from this debilitating disease [1, 14], Surgery has been the mainstay of the treatment in this condition. A variety of surgical modalities have been used for the treatment of advanced oral submucous fibrosis. Simply cutting the fibrotic bands have been reported as generally unsatisfactory or impossible to reduce the trismus because it tends to result in the formation of fibrous tissue and scarring [5].

To overcome this problem many materials have been used to reconstruct the defect created after excision of fibrotic bands from buccal mucosa. Reconstruction modalities include buccal pad of fat, skin grafts, tongue flaps, amnion grafts, nasolabial flaps, palatal island flap and bipaddled radial forearm flap. Additional procedures like masseter muscle myotomy, temporalis myotomy and bilateral coronoidectomy can be performed to enhance the mouth opening [1, 15-16].

The Nasolabial flap was first used for the reconstruction of the defect created after excision of fibrotic bands from the buccal mucosa by Kavarana N.M and Bhathena H.M and it was noted that this part of the cheek remains soft and supple even many years after repair [17]. The nasolabial flap is a pedicled skin flap, inferiorly or superiorly based which can be used unilaterally or bilaterally for local extra oral and intraoral reconstructive

purposes. It was first described by Sushruta in 600 BC. In modern times Esser and Ganzer revived its use in various reconstructive procedures [18], the procedure can be done either in one stage with de-epithelialization of the base or in two stages with secondary transection of the pedicle 3 weeks after the primary intervention. In our study we prefer 2 stage instead of one stage procedure for safer and a better circulation of the flap. The reason why this flap has proved itself so reliable in time is likely in two ways. Firstly, there is a dermosubdermal plexus supplying the whole area. Secondly, this vascular plexus is not haphazard but may exhibit a degree of axially ensuring good perfusion to the most distal parts of the flap. The major contributing vessels to the subcutaneous arterial network include the facial and transverse facial arteries and likely anastomotic contribution from the contra lateral superior and inferior labial vessels [19].

In our study, all 12 patients were found to consume areca nut in one or the other form. 3 patients in this series had the habit of chewing Gutkha (areca quid + tobacco), 4 patients had the habit of chewing Mava/Kharra with Pan Masala and others had the habit of Pan, Betel Nut chewing and also had the habit of smoking and alcohol. The etiological factors found in our study were in accordance with study conducted by Hazarey et al-2007 [8]. All the selected patients had chief complaint of burning sensation on eating spicy food, hot food or on intake of hot beverages. None of the patients complained of nasal regurgitation or nasal intonation. The outstanding signs were limited mouth opening (Mean= 11.5 mm, Range= 6-18 mm). Significant shrinkage and deformity of uvula was seen in 2 patients and fibrotic deformity of the lips in 1 patient. Similar observations and results were found by Borle et al and Cannif et al in their respective studies [1, 10].

Patients were functionally and clinically staged as per the staging system proposed by Haider S.M and Merchant A.T [4]. The small fistula which existed for 3 weeks along the non de-epithelialized pedicle has never caused a problem because of its upward direction and its anterior position in the mouth. The pedicle is preferably transected under local anesthesia [18]. In 4 of our cases we were not able to achieve a satisfactory mouth opening after excision of fibrotic bands

from buccal mucosa so two of the cases were treated by an additional procedure like bilateral coronoidectomy and other two cases were treated by temporalis myotomy, after which a desirable mouth opening was obtained. Yeh.C.Y and Brian .L. Schmidt in their studies for treatment of oral submucous fibrosis in patients with inadequate mouth opening after release of fibrotic bands performed same surgical procedures [5, 20]. Possible intra operative complications with these procedures include damage to facial vessels, Stenson's duct and branches of facial nerve [5, 20]. However we have not encountered these in any of our 12 cases.

Verghese.B.T,etal-2001, Lazardious.N-1998,and Mutimer K.L-1987 in their studies reported post operative complications like flap loss, flap avulsion, flap necrosis, obstructive sialadenopathy or wound dehiscence. However no such complication was encountered in any of our cases [3, 21-22]. In the post operative period the flap got infected in two of our cases which were managed by systemic antibiotics. Mutimer K.L-1987 and Ducic Y -2000 in their studies found Intra oral hair growth as one of the complications and in our study similar complication was observed in 4 patients, which was managed initially by trimming the hair and after the healing was complete, it was managed by epilation [7, 22]. Haider S.M-2000 in their study have reported development of oro cutaneous fistula [4]. In our study extra oral healing at the donor site was uneventful in all the cases except in two patients where orocutaneous fistula was noted. We attributes this to an infection at the base of the flap where transbuccal tunneling was made. It was managed successfully by surgical closure of the fistula under local anesthesia coupled with appropriate systemic antibiotics.

Although the scars were perceptible in all the cases, they were readily accepted by the patients. A definite increase in the mouth opening was observed in all the cases except in one case where we have not achieved satisfactory mouth opening because the patient was not cooperative and had failed to do proper mouth opening exercises daily. Patients were started mouth opening exercises

(using Heister jaw opener) from 2nd post operative day for at least half an hour in the beginning, later the frequency and duration was increased to facilitate improvement in the mouth opening until the satisfactory mouth opening was achieved.

Chin-Jyh Yeh has also recommended early post operative mouth opening exercises [5]. The mean maximum mouth opening we achieved was 36.416 mm at the end of 6th month. A mouth opening of 35 mm as measured from the incisor edges was considered to be the minimum acceptable mouth opening in adult. This outcome is comparable to the favorable outcomes achieved by Kavarana N.M And Bhatena H.M in their studies [5, 17, 23] the results of our study demonstrate the efficiency of nasolabial flap in the reconstruction of the defects created after surgical excision of submucous fibrotic bands in the buccal mucosa.

Conclusion

Our study has evaluated the efficacy of the nasolabial flap in the reconstruction of the defects

in the buccal mucosa, after resection of the fibrotic bands. The versatility of the nasolabial flap is attributed to its rich blood supply. The reconstruction with nasolabial flap is a short, simple, effective, and safe procedure with a low complication rate. Although not encountered in this series of patients, other authors have reported complications (obstructive sialadenopathy, minor or major flap necrosis, wound dehiscence) occurring in their patients. The disadvantages of this flap include intraoral hair growth which can be managed by regular trimming and epilation and an extraoral scar at the donor site, which can be reduced by meticulous suturing.

In spite of the fact that our study included a limited number of cases and a short follow up period, the initial results we obtained were encouraging, permitting us to logically conclude that the nasolabial flap is a feasible and a reliable option that has withstood the test of time for reconstruction of intraoral defects in oral submucous fibros.

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