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Rationale and application of Nasolabial flap in the Management of Oral Submucous Fibrosis-A Case Series

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Abstract: *Oral submucous fibrosis is an insidious chronic debilitating disease affecting the oral cavity, pharynx, and upper digestive tract and associated with restricted mouth opening. Its etiology is directly linked to betel nut chewing, common to the Indian subcontinent, South East, and Pacific Region. Autoimmune and genetic etiologies have been proposed, but betel nut chewing is thought to be the primary cause. OSF's morbidity/mortality is associated with significant masticatory dysfunction and discomfort, as well as an increased risk of developing squamous cell carcinoma. OSF has a malignant transformation rate of 7% to 30% described in different literatures [1,2]. Surgical management of advanced oral submucous fibrosis (OSMF) using bilateral inferiorly based nasolabial flaps is becoming increasingly popular.*

Keywords: *Oral submucous fibrosis, Nasolabial flap, axial pattern flap*

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I. Introduction

Oral submucous fibrosis was first described by Schwartz in 1952 among five Indian females living in Kenya and he coined the term AtrophiaIdiopathica Mucosae Oris.[3] OSF is defined by Pindborg J.J. and Sirsat S.M. (1966) as an "Insidious chronic disease affecting any part of the oral cavity and sometimes the pharynx, although occasionally preceded by and /or associated with vesicle formation, it is always associated with juxtaepithelial inflammatory reaction followed by a fibro-elastic change of the lamina propria with epithelial atrophy leading to stiffness of mucosa and causing trismus.[4,5] The pathogenesis of the disease is thought to be multifactorial; with chewing of betel quid/areca nut being recognized as one of the most important risk factors for OSMF. Various treatment modalities has been tried but surgical management is the mainstay for improving symptoms and quality of life in OSMF. Signaling for development of OSMF arises from underlying connective tissue. If the graft is taken from other sites of oral cavity which might be involved by the disease can cause recurrence.

The nasolabial flap is typically classified as an axial pattern flap based on angular artery. The inferiorly based nasolabial flap is a reliable, economical option for the management of advanced OSMF.[6] Reconstruction of the defect following fibrotomy using nasolabial flap is fast becoming the universally accepted line of treatment for patients having interincisal opening (IIO) <15 mm.[7] Surgical descriptions about nasolabial flap began as early as 1830 when Dieffenbach used superiorly based nasolabial flaps to reconstruct nasal alae. In 1864, Von Langenbeck used the nasolabial flap to reconstruct the nose (Schmidt & Dierks, 2003). Fifty-seven years later, Esser (1921) described the use of the inferiorly based nasolabial flap to close palatal fistulae (Esser, 1921). Here we are presenting five cases of histopathologically proven OSMF managed with inferiorly based bilateral nasolabial flap after surgical excision of fibrotic bands.

II. Material And Methods

A total of five patients of oral submucous fibrosis were admitted and surgically treated in the department of oral and maxillofacial surgery, Guru Nanak Institute of Dental Sciences and Research, Kolkata. All patients signed an informed consent form before surgery. All these patients had advanced oral submucous fibrosis with interincisal distance not more than 20 mm[Figure 1]. Patient's age, sex, etiology, history of gutkha/

tobacco chewing, and preoperative mouth opening were documented. All the cases were histopathologically proven. Patients were followed regularly for six months and maximum interincisal distance was measured.

Table- 1

Sl. No.	Age(Year))	Gender	Pre-operative Interincisal Distance(mm)	Per-operative Interincisal Distance(mm)	3 month Postoperative Interincisal Distance(mm)
1	46	F	14	42	34
2	29	M	12	52	31
3	38	F	9	46	32
4	25	M	8	41	28
5	49	F	10	48	26

Fig1: Intra oral fibrous band in faucial pillar region (A) Preoperative mouth opening (B).

Surgical Procedure:

All the procedures were carried out under general anesthesia using awake nasotracheal intubation with flexible fiberoptic bronchoscopes. The intraoral incisions were made bilaterally to release the fibrous bands using electrocautery along the buccal mucosa at the level of occlusal plane from anterior faucial pillars to 1 cm short of the oral commissure [Figure 2]. The collagen bands were incised up to the muscle layer. After the release of fibrotic bands, tapered defects of approximate length 5 cm and a base of 2 cm were created. Using Fergusson's mouth gag forcible mouth opening w as carried out. Interincisal distance was measured, and a bite block was placed. At this stage, intraoral bilateral coronoidectomy and removal of all third molars were performed. Nasolabial flaps from the tip of nasolabial fold to corner of mouth were marked & bilaterally raised

III. Result

Adequate mouth opening was achieved & maintained with minimum intraoral as well as extraoral scarring. Healing was excellent without evidence of infection, dehiscence ornecrosis.

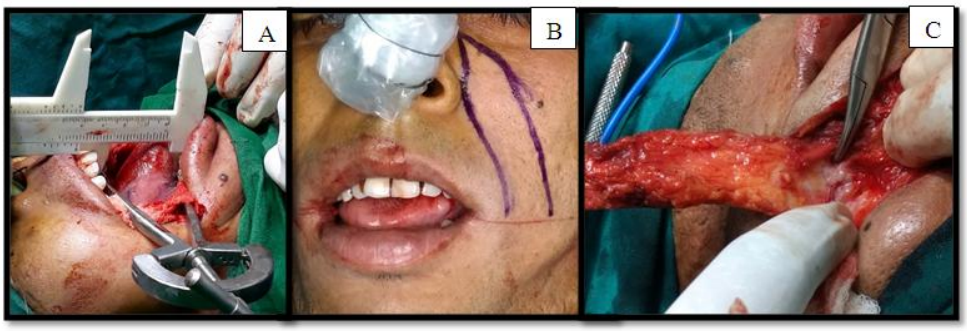

Fig2: Per-operative mouth opening after fibrotomy and bilateral coronoidectmy (A) Incision marking for inferiorly based nasolabial flap (B) Flap elevated (C)

Fig3: Tension free extraoral closure (A) 7th day post-operative mouth opening and healing of graft in place (B) Mucosalisation of graft after 3 month post-operatively(C)

IV. Discussion

Treatment for oral submucous fibrosis is a challenge; as the pathogenesis of this disease is obscure. It is said that once the disease has developed, there is neither regression nor any effective treatment. Consequently, improved oral opening and relief of symptoms form the objective of OSMF treatment. Once trismus has developed, OSMF is irreversible and treatment is focused on restoring mandibular range of motion, oral cancer surveillance and cessation of betel nut habit.[ ] To aid in treatment planning,Khanna and Andrade developed a classification systemof OSF based on interincisal opening:

Group 1: early OSF without trismus (MIO ‹ 35mm)
Group 2: mild to moderate disease (MIO 26 to 35 mm)
Group 3: moderate to severe disease (MIO 15 to25 mm)
Group 4a: severe disease (MIO ‹15mm)
Group 4b: extremely severe–malignant/premalignantlesions noted intraorally

Khanna and Andrade, considering the severity of the trismus and the histopathological findings of secondary muscle degeneration and fibrosis in stages III and IV, suggested surgical treatment was the only solution in patients with stages III or IV, and that bilateral temporalis myotomy and coronoidectomy were highly effective surgical procedure.[8] Materials used for covering the defect following the excision of bands include skin grafts, tongue flaps, buccal fat pat, amnion graft, nasolabial flaps and palatal island flaps. Additional procedures like temporalis myotomy and bilateral coronoidectomy may be performed to enhance mouth opening. A mucosal graft is the best suited for reconstruction after excision of oral submucous fibrosis, as it is an ideal graft to cover the oral mucosa, but is limited by the quantity of oral mucosal available for grafting as other parts of oral mucosa might be affected by the diseases including the tongue. Theoral submucous fibrosis, in a majority of cases,starts in the palate and then progressively involvesthe palatoglossal arches, oropharynx, buccal mucosa,labial mucosa, tongue, and the floor of themouth. By the time the patient goes to a doctor, thedisease has already involved multiple sites. Hence,it is practically impossible to excise all fibrousbands and to graft the site with lingual pedicleflaps" or placental' or skin grafts. Surgical excision,especially with a disease like OSMF, causescontractures during healing. If lingual pedicle flapgrafting is done after excision of a limited amount ofdiseased tissue in the retromolar area, it will certainlyrelieve trismus for a short period. Thetongue, which serves as the donor site, is also involvedin OSMF. It is, therefore, hazardous to grafta part surrounded by the disease with a graft equallyprone to develop the disease.[6]

In our series of patients bilateral inferiorly based nasolabial flap with a reliable subdermal plexus were used for the treatment of advanced oral submucous fibrosis. The dimensions of the flap were adequate to cover the intra-oral defect and layered closure of donor site was achieved to minimize postoperative extra-oral scar. Intraoperative complications like damage to facial vessels, parotid duct and branches of facial nerve were not encountered in any of the patients included in the study. Split-skin grafting has been tried but it has a high failure rate as fibrotic areas have less vascular supply. Skin is not suitable for grafting in elderly people due to atrophy and inelasticity.[10] Tongue flaps are bulky and when used bilaterally cause disarticulation, dysphagia and increased chances of aspiration. In addition, the tongue is involved with the disease process in 38% cases.[9] It does not have problems of buccal fat pad like atrophy in patients with chronic disease and inadequate anterior reach. It is not as bulky as Bilateral radial forearm free flap and is easier to harvest. It has only minor disadvantages like unsightly extraoral scars in some patients and intraoral growth of hair in men. Intraoral hair should be shaved initially and with time this hair growth will reduce.**Consent:** Written informed consent was obtainedfrom the patient for publication of this case report and accompanying images.

Conflicts of interest: None

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