

Original Research Article

Comparison of Platysma Myocutaneous flap, Nasolabial flap and Buccal fatpad in the treatment of oral submucous fibrosis: 30 patient case series.

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ABSTRACT

Objective: The term ‘oral submucous fibrosis’ was coined by Joshi in 1953. It is most widespread in the Indian subcontinent, with prevalence ranging from 0.04% to 24.4% in Southeast Asia. Various surgical treatment approaches have evolved, but the most prevalent is fibrous band excision with or without grafts for fibrosis release. The aim of this case series is to compare buccal fat pad, nasolabial flap and platysma myocutaneous flap in the surgical management of oral submucous fibrosis. **Material & Method:** This prospective RCT study includes 30 patients, 10 patients in each group of oral submucous fibrosis underwent surgical management with Platysma myocutaneous flap, Nasolabial island flap and Buccal Pad of Fat. The outcomes of the groups were evaluated pre-operative and post-operative mouth opening and oral commissural width in the follow up of 3 months. **Results:** The mean increase in postoperative incisal mouth opening was 22.9mm and 23.2mm and the mean increase in inter commissural width was 7.4mm and 8.1mm respectively in the patients treated with nasolabial and platysma myocutaneous flap. In patients who received buccal fatpad the mean increase in mouth opening was 15.7mm and there was no significant change in inter commissural width. **Conclusions:** Although there are various surgical treatment modalities and reconstruction of the defect after incision and release of fibrous bands but platysma myocutaneous flap and nasolabial flap proved to give better results as the interposition material for better incisal mouth opening in stage IV cases with minimal chances of relapse while BFP for stage III cases. **Keywords:** oral submucous fibrosis, platysma myocutaneous flap, nasolabial flaps, buccal fat pad, trismus.

1. Introduction

‘Oral submucous fibrosis’ (OSMF) is a well-known entity described since the time of Sushruta as ‘Vidari’¹. OSMF is defined 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 juxta-epithelial inflammatory reaction followed by fibroelastic change of lamina propria, with

epithelial atrophy leading to stiffness of the oral mucosa and causing trismus and inability to eat. With further progression, it leads to difficulty in mastication, speech, and swallowing². According to most research, the etiology of OSMF includes not only local irritating causes, but also systemic involvement such as vitamin B12 insufficiency, iron deficiency, zinc deficiency, and anaemia contribute equally. Chillies, chewable tobacco, and areca nut are all common local irritants. Copper

concentration is high in the areca nut, which leads to increased collagen synthesis and decreased collagen breakdown. Fibrous bands occur as a result of enhanced collagen synthesis.^{3,4} The continuous burning sensation in the buccal mucosa while eating spicy meals is the early clinical symptom of OSMF. Clinically OSMF is divided into the following stages: stomatitis, fibrosis and sequelae.⁵

Treatment for oral submucous fibrosis has been palliative and focused, with the goal of improving mouth opening and alleviating symptoms. In advanced cases where surgical therapy is the treatment of choice, conservative pharmacological treatment is ineffective.⁶ Severe degree of trismus is a challenging surgical problem. Various surgical treatment approaches have evolved, but the mainstay is the excision of fibrous bands with or without grafts to release fibrosis. After incision and release of fibrous bands, a range of techniques are used to reconstruct the defect, including the island palatal mucoperiosteal flap, bilateral tongue flap, split thickness skin graft, radial forearm flaps, platysmal myocutaneous flap, buccal fat pad graft, and nasolabial flaps.⁷ The aim of this article was to compare buccal fat pad, nasolabial flap and platysmal myocutaneous flap in surgical management of oral submucous fibrosis.

2. MATERIAL AND METHODS

2.1 Patients

This prospective RCT study included 30 patients who exhibited Oral submucous fibrosis and were referred to the Department of Oral and Maxillofacial Surgery, from 2017 to 2021 with chief complaints of restricted mouth opening, burning sensation in mouth, intolerance to hot and spicy food or combination of all and were screened for clinical and histopathological diagnosis of oral submucous fibrosis. The patients after inclusions were divided by random lottery method into group 1, group 2 and group 3 (10 patients in each group). Group 1 patients of oral submucous fibrosis will undergo with surgical management with Nasolabial island flap, Group 2 with Buccal Pad of Fat and Group 3 with platysma myocutaneous flap.

2.2. Surgical treatment strategy

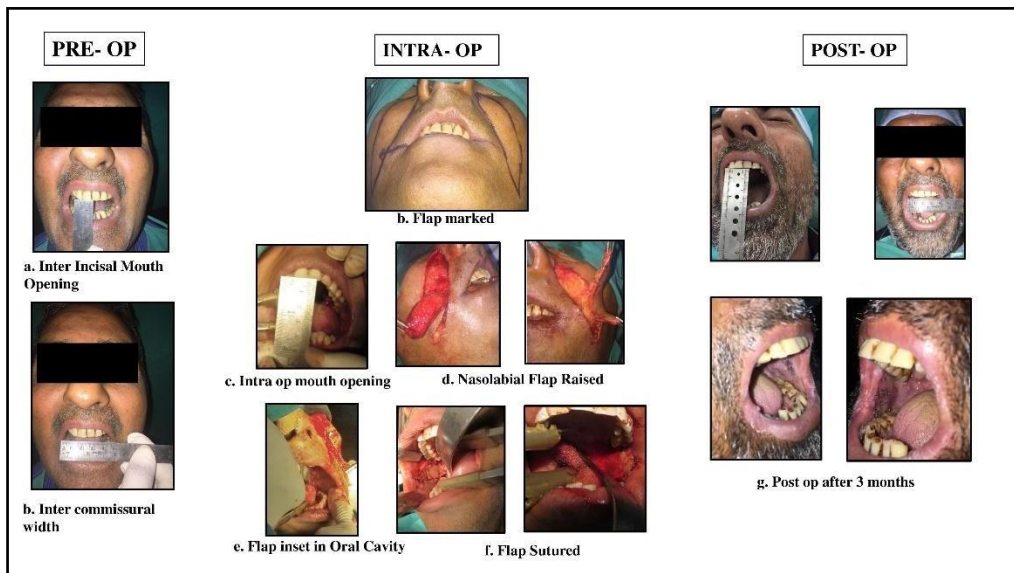
All patients were treated under general anaesthesia through nasotracheal intubation using fiberoptic method. Prior to surgical treatment all the routine Investigations hemograms and histopathological evaluation were carried out. The patients were operated by single operator.

2.1.1 Incision and fibrous bands release:

Intraoral bilateral infiltration was given along the planned incision line with 1:2,00,000 epinephrine concentration. Incisions were made using number 15 Bard Parker blade and electrocautery on each side of buccal mucosa at the level of occlusal plane away from Stenson's duct orifice. Incisions extended from the corner of the mouth anteriorly to the anterior pillar of fauces, soft palate and / or pterygomandibular raphe posteriorly depending on the extent of fibrous bands felt by palpation. Blunt dissection and undermining was done until no restrictions were felt.

2.1.2 Reconstruction with Nasolabial flap:

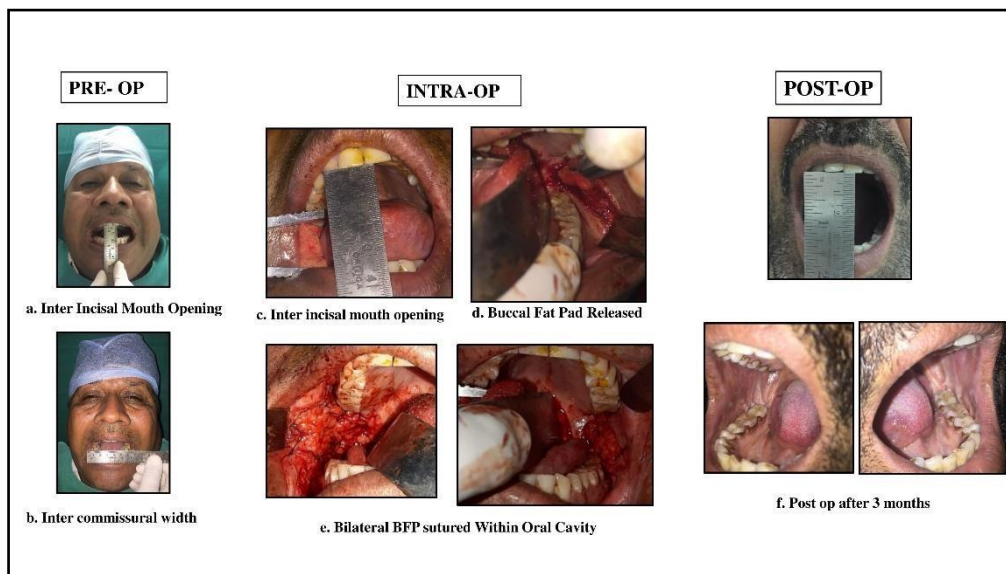
In group 1 patients, in whom reconstruction was planned with extended nasolabial flap, extractions of upper and lower third molars were done. In these patients, after incising the fibrous bands and achieving acceptable range of mouth opening, elliptical shaped nasolabial flaps were marked with methylene blue ink. Flaps extended from the tip of the nasolabial fold to the inferior border of the mandible. The medial incision line followed the nasolabial folds till the inferior third and the width of the flap was kept 1.5-2 cm with medial and lateral limbs of the incision tapering at the ends. Bilaterally, flaps were raised in the plane of superficial musculoaponeurotic system from both ends to the region of central pedicle 1 cm away from the corner of the mouth. The diameter of the pedicle was roughly 1.5-2 cm. A transbuccal tunnel was created near the region of modiolus. The flap was then transposed intraorally in tension free manner. The superior wing of the flap was sutured to the posterior edge of the defect while inferior wing was sutured to the anterior edge of the defect using 3-0 vicryl suture material. Undermining of the donor site was done in the subcutaneous plane and layer closure done with 3-0 vicryl for deeper layer and 4-0 ethilon for skin. (Figure 1a-g).



2.2.3 Reconstruction with buccal fat pad graft:

In group 2 patients, in whom reconstruction was planned by buccal fat pad graft after incising the fibrous bands and achieving acceptable range of mouth opening, buccal fat pad was approached through the postero-superior margin of the created defect. After

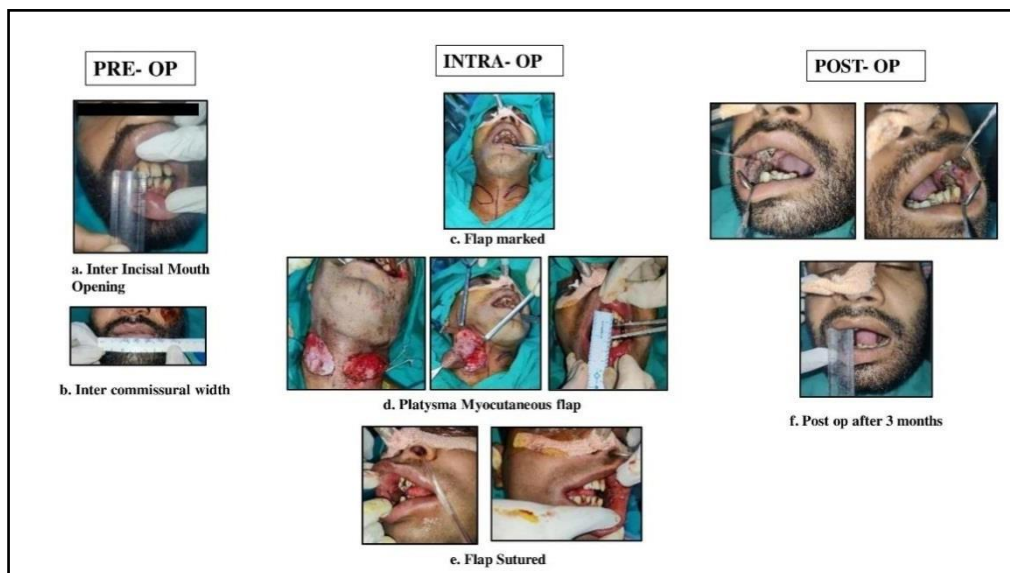
blunt dissection, buccal fat pad was teased out gently until sufficient amount was obtained to cover the defect without tension. Buccal fat pad was then secured over the defect with 3-0 vicryl suture material using interrupted and mattress sutures. (Figure 2a-f)



2.2.4 Reconstruction with platysmal myocutaneous flap:

In group 3 patients, after incising the fibrous bands, a Platysma Myocutaneous muscle flap was elevated superiorly. The intended skin paddle was sketched on the ipsilateral neck, below the inferior border of the mandible, with the neck hyper stretched. The skin paddle measured roughly 4.5*6.5 cms in length. The superior incision was performed first, and a plane close to the inferior border of the jaw was meticulously dissected superficial to the platysma muscle. The platysma muscle was also exposed inferiorly after a skin

incision was made near the inferior line of the skin paddle. A subplatysmal plane of dissection developed right below the inferior border of the mandible after the platysma muscle was transected sharply at least 1 cm inferior to the edge of the skin paddle. For full mobilisation, platysma myocutaneous flap was transected vertically, anteriorly, and posteriorly. By establishing an approximate sized soft tissue tunnel, the flap was inserted into the oral defect. The defect was sutured to the excised flap. The donor site was closed in layers for an effective closure (Figure 3a-e)



2.3 Category of clinical characteristics

Clinical characteristics including age, sex, mouth opening and oral commissural width were recorded for both the group of patient's treated surgically for oral submucous fibrosis with nasiolabial flap and buccal fat pad.

2.4 Evaluation of treatment outcome

The outcomes of both nasiolabial flap and buccal fat pad groups were evaluated at 3-month follow-up visits. After tenth postoperative day, intense physiotherapy was started using Heister's mouth gag for both the groups. Duration and frequency were increased later to achieve the intraoperative values. Patients were instructed and motivated to continue the physiotherapy themselves for 6 months.

2.5 Statistical analysis

The analysis of data was done using SPSS version 20 (IBM SPSS Statistics Inc., Chicago, Illinois, USA) Windows software program. Descriptive statistics included computation of percentages, means and standard deviations. The unpaired t test (for quantitative data to compare two independent two groups), and paired t test (for quantitative data to compare before and after observation). Level of significance was set at $p \leq 0.05$.

2.6 Ethical approval/confirmation of patients' permission

This study was approved as an 'exempt study' by the Institutional Review Board. A standard Performa was

used to collect necessary information regarding each case after inclusion and all the information was kept confidential. The patients were informed about the study and necessary consent was taken from the concerned personnel.

3. RESULTS

The inter group comparison of preoperative and postoperative incisal mouth opening and commissural width of patients with nasiolabial flap, buccal fat pad and platysmal myocutaneous flap are shown in table 1, 2 and 3 respectively which shows statistically significant difference with p value < 0.05 at incisal mouth opening as well as at commissural area of mouth when compared pre-operatively and post-operatively after raising nasiolabial fat pad, buccal fat pad & platysmal myocutaneous flap, but the p value (**0.001**) is highly significant in the patients treated with nasiolabial & platysmal myocutaneous flap. The mean increase in postoperative incisal mouth opening was 22.9mm and 23.2mm and the mean increase in inter commissural width was 7.4mm and 8.1mm respectively in the patients treated with nasiolabial and platysma myocutaneous flap. In patients who received buccal fat pad the mean increase in mouth opening was 15.7mm and there was no significant change inter commissural width.

Table 1. Intra-Group Comparison of Nasolabial Flap					
		Mean	Std. Deviation	Mean diff	P value
Incisal MO	Pre op	10.10	4.012	22.9	0.001 (HS)
	Post op	33.00	3.800		
Commissural width	Pre op	42.10	2.906	7.4	0.001 (HS)
	Post op	49.50	4.60072		

Table 2. Intra-Group Comparison of Buccal Fat Pad					
		Mean	Std. Deviation	Mean diff	P value
Incisal MO	Pre op	11.90	1.792	15.7	0.02 (S)
	Post op	27.60	3.921		
Commissural width	Pre op	43.30	3.59166	1.1	0.02 (S)
	Post op	44.40	3.53396		

Table 3. Intra-Group Comparison of <u>Platysmal Myocutaneous flap</u>					
		Mean	Std. Deviation	Mean diff	P value
Incisal MO	Pre op	11.0	5.404	23.2	0.001 (HS)
	Post op	34.2	5.3		
Commissural width	Pre op	37.4	3.68	8.1	0.001 (HS)
	Post op	45.5	4.2		

The inter group comparison of preoperative and postoperative incisal mouth opening and commissural width of patients with nasolabial flap buccal fat pad & platysmal myocutaneous flap are shown in table 4

and 5 respectively. On inter group comparison there was significant increase in incisal mouth opening & commissural width.

		Mean	Std. Deviation	Mean diff	P value
Pre op	nasolabial flap	10.10	4.012	1.8	0.21
	buccal fat pad	11.90	1.792		
	<u>Platysmal</u> myocutaneous flap	11.0	5.404		
Post op	nasolabial flap	33.00	3.800	5.4	0.006(S)
	buccal fat pad	27.60	3.921		
	<u>Platysmal</u> myocutaneous flap	34.2	5.3		

		Mean	Std. Deviation	Mean diff	P value
<u>Preop</u>	nasolabial flap	42.100	3.63	1.2	0.46
	buccal fat pad	43.300	3.59		
	<u>Platysmal</u> myocutaneous flap	37.4	3.68		
Post op	nasolabial flap	49.500	4.60	5.1	0.01(S)
	buccal fat pad	44.400	3.23		
	<u>Platysmal</u> myocutaneous flap	45.5	4.2		

4. DISCUSSION

Surgical treatment is useful in advanced cases of OSMF that present with severe trismus and do not respond to medication.⁴ Relapse is a typical consequence following trismus surgery. Even when attempts were made to inhibit collagen formation by insertion of steroid impregnated packs, simple removal of the fibrotic bands followed by forcible mouth opening and secondary epithelisation produced an inadequate stiff buccal mucosal surface.⁷

Our study revealed that the 3 months postoperative mouth opening in patients who received nasolabial flap, buccal fat pad and platysma myocutaneous flap the mean increase was 22.9mm, 23.2mm and 15.7 mm

respectively. The mean increase in inter commissural width in patients who received nasolabial flap and platysma myocutaneous was 7.4mm and 8.1mm respectively while in patients who received buccal fat pad there was no significant change inter commissural width. The nasolabial flap has advantages such as the donor site is in the same operating field, reliable and rich vascularity, provides versatility in design, availability of tissue in abundance to cover large defect without tension, with the drawbacks of intraoral hair growth and the possibility of a hypertrophic scar at the donor site.⁸ Although buccal fat pad grafts provide benefits such as a rich vascular supply, little donor site morbidity, ease of surgery, and good patient acceptance, it has been discovered that individuals with chronic

disease have severe buccal fat pad atrophy. Furthermore, the anterior reach of the buccal fat pad is usually insufficient, and the region anterior to the cupid must be left raw. Secondary intention cures the raw area, resulting in fibrosis and a progressive relapse.^{9,10}

The advantages of platysmal myocutaneous flap include good colour match, easy access to the donor site in the same surgical field with low donor site morbidity, donor site easily sutured and adequate flap thickness for the defects of the oro facial region.¹¹

Paymaster was the first to characterise the precancerous characteristics of OSMF in 1956. It's a well-known precancerous condition with a significant risk of malignant transformation (1.9%-7.6%).¹² Burning sensations of the mucosa, intolerance to hot and spicy foods, mucosal blanching, feeling, dryness of the mouth, and recurring stomatitis are all diagnostic criteria for OSMF in its early stages. The buccal mucosa, soft palate, and faucial pillars show fibrosis, followed by stiffness.^{5,13}

For advanced therapy of OSMF, many surgical treatment techniques are possible after releasing fibrous bands. The platysmal myocutaneous flap and nasolabial flap is simple to master, and it can heal defects as large as 6 to 7 cm¹⁴. The amount of tissue makes it possible to conceal a significant defect without causing tension. To effectively manage both early and severe phases of oral submucous fibrosis, the treatment should be combined with cessation of betel quid or gutkha chewing, daily mouth opening exercises, and sufficient diet.⁴

5 CONCLUSION

In conclusion, platysmal myocutaneous flap, nasolabial flap and buccal fat pad are useful in advance stage of oral submucous fibrosis. The results of our study may direct us that platysmal myocutaneous and nasolabial flap proved to give better results as the interposition material for better incisal mouth opening in advance stages of oral submucous fibrosis with minimal chances of relapse but the postoperative external scar and intra oral hair growth are complications associated with Nasolabial Flap.

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Conflict of interest

The authors declare that they have no conflict of interest.

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