

A Prospective Study to Compare Temporoparietal Fascia Flap and Buccal Fat Pad in Surgical Management of Oral Submucous Fibrosis

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ABSTRACT

Aim: To evaluate the application of temporoparietal flap versus buccal fat pad graft in the surgical management of oral submucous fibrosis.

Material and Methods: This prospective study was carried out in the Department of Dentistry, American International Institute of Medical Sciences, Udaipur, Rajasthan, India. A total of 10 patients were selected for study. These 10 patients were randomly divided into two groups group 1 and group 2. In group 1 patients, reconstruction was planned with buccal fat pad graft and in group 2 patients, reconstruction was planned with temporoparietal flap respectively. Statistical Analysis Used Man Whitney U test.

Results: The mean interincisal distance of selected patients was 12 mm. According to by Mann-Whitney U test the increase in the interincisal distance (after 6months) for Group I was 143.04% and Group II was 109.09%.

Conclusions: In the present study, buccal fat pad graft proved to give better results as the interposition material as it has good

patient acceptance, rapid epithelization, minimal donor site morbidity and minimal intra and postoperative complications.

Key words: Buccal Fat Pad, Oral Submucous Fibrosis, Temporoparietal Flap, Mouth Opening.

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INTRODUCTION

Oral submucous fibrosis (OSMF or OSF) is a chronic, complex, premalignant (1% transformation risk) condition of the oral cavity, characterized by juxta-epithelial inflammatory reaction and progressive fibrosis of the submucosal tissues (the lamina propria and deeper connective tissues). As the disease progresses, the jaws become rigid to the point that the person is unable to open the mouth.^{1,2} The condition is remotely linked to oral cancers and is associated with areca nut or betel quid chewing, a habit similar to tobacco chewing, practiced predominantly in Southeast Asia and India, dating back thousands of years.

In the initial phase of the disease, the mucosa feels leathery with palpable fibrotic bands. In the advanced stage the oral mucosa loses its resiliency and becomes blanched and stiff. The disease is believed to begin in the posterior part of the oral cavity and gradually spread outward.

Oral submucous fibrosis is clinically divided into three stages:³

Stage 1: Stomatitis

Stage 2: Fibrosis

- a- Early lesions, blanching of the oral mucosa
- b- Older lesions, vertical and circular palpable fibrous bands in and around the mouth or lips, resulting in a mottled, marble-like appearance of the buccal mucosa

Stage 3: Sequelae of oral submucous fibrosis

- a- Leukoplakia
- b- Speech and hearing deficits

Khanna and Andrade in 1995 developed a group classification system for the surgical management of trismus:⁴

Group I: Earliest stage without mouth opening limitations with an interincisal distance of greater than 35 mm.

Group II: Patients with an interincisal distance of 26–35 mm.

Group III: Moderately advanced cases with an interincisal distance of 15–26 mm. Fibrotic bands are visible at the soft palate, and pterygomandibular raphe and anterior pillars of fauces are present.

Group IVA: Trismus is severe, with an interincisal distance of less than 15 mm and extensive fibrosis of all the oral mucosa.

Group IVB: Disease is most advanced, with premalignant and malignant changes throughout the mucosa.

Biopsy screening although necessary is not mandatory most dentist can visually examine the area and proceed with the proper course of treatment. The treatment depends on the degree of clinical involvement. If the disease is detected at a very early stage, cessation of the habit is sufficient. Most patients with oral submucous fibrosis present with moderate-to-severe disease. Severe oral submucous fibrosis is irreversible. Moderate oral submucous fibrosis is reversible with cessation of habit and mouth opening exercise. Current modern day medical treatments can make the mouth opening to normal minimum levels of 30 mm.

Oral submucous fibrosis (OSMF) is a potential malignant disorder and various surgical modalities are used to improve mouth opening. Numerous grafts are available to cover post fibrotic release defects like skin, placental grafts, tongue flaps, greater palatine pedicle flaps, buccal fat pad, nasolabial flaps, radial forearm flap, temporoparietal fascia flap.

This study was undertaken to compare effectiveness and post-operative results of reconstruction with temporoparietal fascia flap to those of reconstruction with buccal fat pad in terms of mouth opening and symptoms after the release of fibrosis.

AIMS & OBJECTIVES

- To compare effectiveness of temporoparietal fascia flap and buccal fat pad in reconstruction of buccal mucosal defects in surgical management of OSMF.
- To evaluate available flap surface area, thickness and post-operative healing, ease of harvest & donor site morbidity.

MATERIALS & METHODS

This in-vivo study with 10 subjects was conducted in the Dept. of Dentistry at American International Institute of Medical Sciences, Udaipur. The subjects selected in the study were suffering from Grade III & IV OSMF (Khanna's & Andrade grading). The patients with previous surgical treatment for OSMF and Grade I & II OSMF (Khanna's & Andrade grading) were excluded.

The preoperative inter- incisal distance was evaluated. The subjects were divided into two study groups with 5 subjects each. The subjects in the Group I were treated by reconstruction with buccal pad of fat and those in Group II were treated by reconstruction with temporoparietal fascia flap.

SURGICAL PROCEDURE FOR GROUP I

After administering general anaesthesia; fiber optic naso-tracheal intubation was done. The fibrous bands were resected (Fig.I) and mouth was then forced open with Heisters jaw opener. The coronoid process was exposed and temporalis myotomy (Fig.II) was performed followed by coronoidectomy (Fig.III). The third molars were extracted & forceful mouth opening up to 35 –50 mm was achieved using Heisters jaw opener (Fig.IV).

The incision was placed high in maxillary vestibule, beginning above second molar & extending posteriorly for 2cm. Buccal fat pad was approached by bluntly opening fine haemostat and was dissected until fat protruded in the mouth (Fig.V). It was then secured in place with horizontal mattress sutures (Fig.VI). The graft was secured with bolster gauze pack (Fig.VII)

Figure I: Resected Fibrous Bands



Figure II: Exposure of Coronoid & Temporalis Myotomy



Figure III: Coronoidectomy



Figure IV: Removal of Third Molar Teeth & Forceful Mouth Opening Up To 35 –50 Mm



Figure V: Buccal Fat Pad Was Teased Into Mouth.

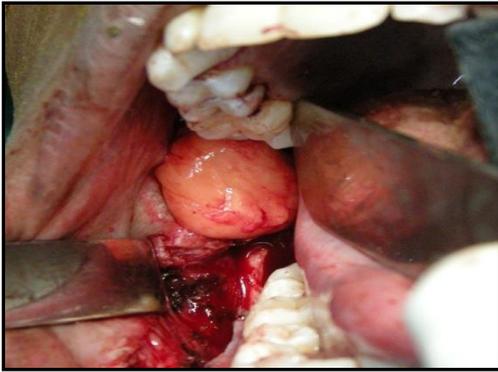


Figure VI: Buccal Fat Pad, Secured In Place With Horizontal Mattress Sutures.



Figure VII: Graft Was Secured With Bolster Gauze Pack.



SURGICAL PROCEDURE FOR GROUP II

After administering general anaesthesia; fiber optic naso-tracheal intubation was done. The incision lines were demarcated to raise the temporoparietal flap (Fig. VIII). The hemicoronal incision extended till preauricular crease and in front of tragus and deepened to subcutaneous layer below hair follicle in subfollicular plane.⁵ The dissection performed through plane in which subcutaneous fat attaches to temporoparietal fascia. The anterior and posterior scalp flap was elevated off from underlying temporoparietal fascia (Fig IX). The elevation of temporoparietal flap was then performed in subgaleal plane downward to zygomatic arch (Fig X). Flap was transferred to oral cavity through tunnel made below zygomatic arch (Fig. XI). The suturing of flap done intraorally (Fig XII). The drains were placed in temporal region and flap was secured with bolster gauze pack (Fig. XIII).

The subjects were monitored over a period of six months and preoperative and postoperative mouth opening were evaluated

(Fig. XIV and XV). The data was statistically analysed using Mann-Whitney U test

Figure VIII: Marking For Temporoparietal Flap

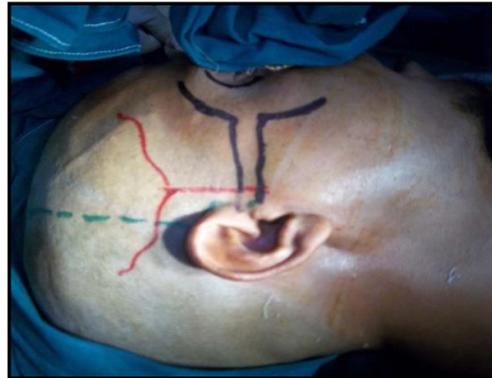


Figure IX: Anterior and Posterior Scalp Flap Elevated Off From Underlying Temporoparietal Fascia.



Figure X: Elevation of Temporoparietal Flap In Subgaleal Plane Downward To Zygomatic Arch



Figure XI: Flap Transferred To Oral Cavity Through Tunnel Made Below Zygomatic Arch.

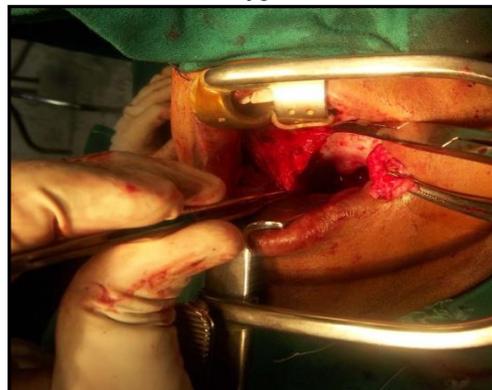


Figure XII: Sutured Intraoral Flap



Figure XIII: Flap Was Secured With Bolster Gauze Pack.



Figure XIV: Reconstruction with Buccal Fat Pad

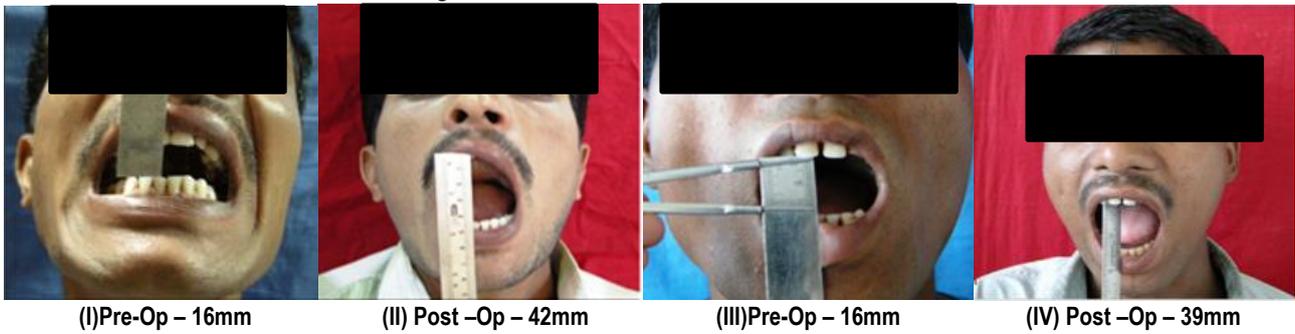


Figure XV: Reconstruction with Temporoparietal Fascia Flap

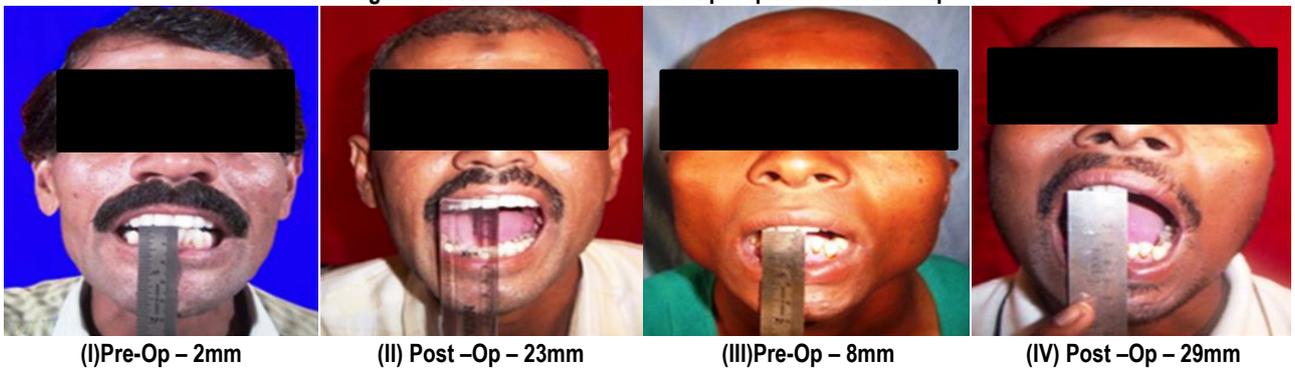


Table 1: Percentage Distribution of Samples by Staging in Two Groups

| Case No. | Groups | Preop - interincisal Distance (mm) | Khanna and Andrade Staging of OSMF |
|----------|----------|------------------------------------|------------------------------------|
| 1 | GROUP I | 15 | III |
| 2 | | 16 | III |
| 3 | | 17 | III |
| 4 | | 16 | III |
| 5 | | 15 | III |
| 6 | GROUP II | 10 | IV a |
| 7 | | 9 | IV b |
| 8 | | 8 | IV a |
| 9 | | 2 | IV a |
| 10. | | 12 | IV a |

Table 2: Interincisal Distance at Different Intervals (ID)

| S.N. | INTERINCISAL DISTANCE AT DIFFERENT INTERVALS(ID) | GROUP I | GROUP II |
|------|--|---------|----------|
| 1. | Pre-Operative ID | 15.80mm | 8.80mm |
| 2. | Forced Intra Operative ID | 49.80mm | 44.40mm |
| 3. | After 1 Week ID | 45.40mm | 34.80mm |
| 4. | After 1 Month ID | 43.00mm | 31.60mm |
| 5. | After 3 Months ID | 42.80mm | 21.20mm |
| 6. | After 6 Months ID | 34.40mm | 18.40mm |

RESULTS

Comparison of interincisal distance by Mann-Whitney U test.

- p value
 - Intraoperative inter incisal distance - 0.0472
 - After 1st week - 0.0090
 - After 1 month - 0.0090
 - After 6 months - 0.0122

According to by Mann-Whitney U test the increase in the interincisal distance (after 6months) for Group I was 143.04% and Group II was 109.09%.

DISCUSSION

Oral submucous fibrosis is a chronic inflammatory disease affecting the oral mucosa and has a high risk of malignant transformation. This disease is predominantly found in the Indian subcontinent. The highest incidence is found in South India, with an overall prevalence rate of 2.5% in various states of the country.⁶ Though the exact etiology is unknown, chronic irritation due to habit of chewing betel nut in various forms is considered as a major contributory factor. Experimentally, alkaloid component of the arecanut, arecoline and capsaicin, the active irritant in chillies have been implicated. Numerous medical and surgical modalities have been proposed to alleviate the signs and symptoms of the disorder. Conservative measures include topical application of vitamin A, steroids and oral iron applications in milder cases to local submucosal injection of placental extract, steroids and hyaluronidase for moderate cases.^{7,8} But in severe cases, surgical excision of the fibrotic bands and reconstruction with a graft is the popular and accepted treatment of choice.

Traditionally, the buccal fat pad has been considered as a nuisance when it accidentally herniates into mouth during intraoral surgery, where it is treated by excision or reduction and mucosal suturing.⁹

Yen, who first described the application of buccal fat pad for oral submucosal fibrosis, found that a pedicled graft of buccal fat enables closure of oral defects up to 3 x 5 cm and 6 mm in thickness with no obliteration of the oral vestibule and very little morbidity at the donor site as compared to other local flaps.¹⁰ Mehrotra et al. also used buccal fat pad in various maxillofacial surgeries like submucosal fibrosis, oroantral fistulae and scar tissue adhesions in the cheek with good results.¹¹

Long standing oral sub mucous fibrosis is a debilitating disease. It presents with difficulty in mouth opening with poor oral hygiene and its complications. The aim of treatment for this condition is to provide good release of fibrosis and provide long term results in terms of mouth opening. Conservative treatment with local steroids, hyaluronidase injections and physiotherapy are not beneficial in advanced cases.⁸ Surgery is required in all advanced cases.⁴ Release of fibrosis and split skin grafting have a high recurrence rate due to graft shrinkage.¹¹

This new technique releases strong muscles of mouth closure such as masseter from its origin and temporalis from its insertion. Intra oral release of the mucosa, pterygomandibular raphe and buccinator muscle leaves a mucomuscular defect. Well vascularised superficial temporal fascia flap brings good blood supply for the fibrosed muscles and mucosa and provides a healthy bed for the skin graft.¹²⁻¹⁶ This procedure has its foundation on anatomical landmarks and physiological facts and is an effective method of treating oral sub mucous fibrosis.

Then present study was conducted to compare the buccal fat pad and temporoparietal fascia flap in the reconstruction of submucous fibrosis surgeries and despite of many advantages, temporoparietal flap are seldom used intraorally by head and neck surgeon. The literature reveals little in the way of complications of such flaps like facial nerve injury, alopecia over the incision, flap failure, more operating time(technique sensitive), invasive, scalp necrosis.

As per the present study buccal fat pad is superior than Temporoparietal fascia flap. However, the limitation of mandibular opening in Temporoparietal fascia flap did not occur as an immediate postoperative event as would be expected by this explanation. Periosteal tissue included in the flap could give rise to new bone formation and explain the delayed onset of the restricted mandibular opening.

CONCLUSION

The present study was conducted to assess the postsurgical improvement in mouth opening following use of buccal fat pad and temporoparietal fascia flap in surgical management of oral submucous fibrosis.

In the present study buccal fat pad graft proved to give better result as the interpositional material as it has good patient acceptance, rapid epithelisation, minimal donor site morbidity and minimal intra and post-operative complications. Vigorous mouth opening exercises, cessation of habits and improvement in the nutritional status are must for better results post operatively. However further long term studies are still needed to prove the efficacy of this treatment option.

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