



## Original Research Article

## Resection of fibrous bands, extraction of third molars, bilateral coronoidotomy, masticatory muscle myotomy and comparison of collagen membrane and buccal fat pad graft in surgical management of stage III, IV oral submucous fibrosis

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## ABSTRACT

**Background:** Oral submucous fibrosis is a treacherous, devastating state of the mouth bringing about critical wellbeing and social issues, which may meddle with the standard assessment of the oral depression for malignancy, satisfactory nourishing admission, dental cleanliness and discourse.

Medicines proposed for OSMF have been palliative instead of remedial. They are pointed toward improving the patient's capacity to open the mouth, which becomes confined when more scar tissue is shaped as the illness advances. Various unions are accessible today to cover the post fibrotic discharge deformity however none of them alone gave a drawn out victories. In our investigation we looked at two modalities as they were generally advantageous and convey less postoperative morbidity. Collagen sheet as a join to cover the careful deformity and the buccal cushion of fat turned onto the imperfection as a unite to cover it.

**Aims and Objectives:** The current investigation was led to assess the clinical viability of collagen film and buccal cushion of fat join for careful administration of Oral Submucous fibrosis with extraction of third molars, two-sided coronoidotomy, masticatory muscle myotomy with arrival of fibrosis and remaking by collagen layer unite in five patients and buccal fat cushion join in five patients of clinically analyzed stage III, IV Oral Submucous fibrosis with a subsequent time of a half year from September 2010 to September 2012 at Department of Oral and maxillofacial Surgery in Al Badar Rural Dental College and Hospital.

**Materials and Methods:** Ten patients with chief complaint of difficulty in mouth opening with no previous history of any medical or surgical line of treatment and clinically diagnosed as stage III, IV Oral submucous fibrosis were included in this study. Preoperative clinical findings, radiological investigations and maximum incisal distance were assessed for the need of surgical procedure for Oral submucous fibrosis. All the patients underwent extraction of third molars, bilateral coronoidotomy, masticatory musculomyotomy, release and resection of fibrous bands with grafting of buccal defects with collagen membrane in five patients and with pedicled buccal fat pad graft in five patients with a 6 month follow up period. The interincisal distance was evaluated as an objective criteria at time intervals of 10<sup>th</sup> day, 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> months postoperatively. Clinically healing was assessed by means of digital photography of granulation at 14<sup>th</sup> day, epithelization at 1 month and wound contracture at 3 months post-operatively.

**Results:** Mean preoperative interincisal distance of 18.4mm was compared to immediate post operative interincisal distance of 37.3mm and 36.2 mm at follow up of 1 month, 34.8mm after 3 months and 35.2mm after 6 months with mean increase of 30.8mm after 6 months follow up. Healing in terms of granulation was assessed to be good in 4 out of 5 patients compared to buccal fat pad group where only 2 patients had good result. Epithelization was good in 4 patients and fair in 1 patient in collagen membrane group compared to buccal fat pad group where epithelization was predominantly fair in 3 patients and good in only 2 patients.

**Conclusion:** This investigation reasoned that extraction of third molars, reciprocal coronoidotomy, masticatory muscle myotomy with the resection of sinewy groups is the favored careful administration for long haul results and recreation with collagen film filled in as a superior substitute option in contrast to buccal fat cushion, since it offered wide zone of inclusion, quicker mending and great patient acknowledgment.

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## 1. Introduction

Oral Submucous Fibrosis (OSMF) causes reformist limitation of mouth opening by obsessive statement of collagen in the submucosal connective tissue and might be joined by premalignant mucosal changes.<sup>1</sup> It brings about expanded fibroelastic changes joined by epithelial atrophy.<sup>2</sup> Thusly, the most well-known confusions are critical restrictions in mouth opening and extensive trouble in eating.

Lockjaw diminishes patients' personal satisfaction and can effect sly affect their oral cleanliness and dietary status. Inferable from the dark etiology of the sickness the backbone of the therapy is focused on endeavors to improve mouth opening and alleviate the manifestations by therapeutic or careful methods. Medicines proposed for OSF have been palliative as opposed to therapeutic. They are pointed toward improving the patient's capacity to open the mouth, which becomes confined when more scar tissue is framed as the infection advances. Various unions are accessible today to cover the post fibrotic discharge imperfection yet none of them alone gave a drawn out victories.

Examination has demonstrated the idea of an ideal climate for wound fix and the dynamic contribution of the injury dressing in building up and keeping an ideal climate. Over the ages, an assortment of dressing materials have been assessed for reasonableness as transitory or lasting cover to treat exposed zones and careful deformities trying to create ideal injury cover.

In our examination we thought about two modalities as they were generally advantageous, collagen sheet as a unit to cover the careful imperfection and the buccal cushion of fat pivoted onto the deformity as a join to cover it.

Present investigation was directed with a mean to assess the clinical viability of collagen layer and buccal fat cushion unite for accomplishing brings about terms of mouth opening after executing the stringy groups, extraction of third molars, two-sided coronoidotomy and masticatory muscle myotomy. Mending of both the unions were surveyed on clinical boundaries of granulation on fourteenth day, epithelization at first month and twisted contracture as a target rules on third month.

## 2. Materials and Methods

This study was conducted at department of Oral and Maxillofacial Surgery of Al-Badar Rural Dental College and Hospital, Gulbarga. Patient's with chief complaint of long standing difficulty in mouth opening and positive history of betel nut, supari, tobacco chewing, with or without lime were assessed.

All patients were examined thoroughly and 10 patients with clinically confirmed as stage III (MIO 25mm-15mm), stage IV (MIO > 15mm)<sup>3</sup> Oral Submucous Fibrosis was included in the study. These patients were divided into two groups receiving buccal fat pad grafting as one group and the other as collagen membrane group.

Preoperative interincisal distance was measured and recorded. The patients were counseled to quit their habit and co-operative for physiotherapy post-operatively. All the procedures were carried out under general anesthesia wherein the patients were intubated and anaesthetized using fibre-optic naso-tracheal intubation<sup>9</sup>. Surgical skin preparation of the face was performed by scrubbing with cetrimide 20%, standard normal saline and painting with 5% aqueous solution of povidoneiodine respectively 21.

Resection of fibrous bands:<sup>1-4</sup>

1. The incisions were made with an electrosurgical knife along each side of the buccal mucosa at the level of the occlusal plane away from the Stenson's orifice. Incisions were extended posteriorly to the pterygomandibular raphe and anteriorly as far as the corner of the mouth, depending upon the location of the fibrotic bands which restricted mouth opening. These fibrotic bands were incised or excised as detectable by palpation.
2. The wounds created were further freed by manipulation until no restrictions were felt.
3. The mouth was then forced open with a heister's mouth gag to an acceptable range of approximately 35-45 mm.

### 2.1. Coronoidotomy and masticatory muscle myotomy:<sup>1,2,4-6</sup>

1. This incision was extended vertically along the coronoid process up to its tip. The overlying tissue was cleared by sharp dissection till the coronoid process was visible. Using a micromotor burr, chisel and mallet, the coronoid process was excised.
2. The insertion of temporal muscle, medial pterygoid and the originating fibres of masseter muscles were relieved.<sup>7-9</sup>

### 2.2. Removal of third molar teeth<sup>5</sup>

All the third molars teeth were extracted.

### 2.3. Intraoperative forced mouth opening

1. A mouth opening of 35-45 mm as measured from the incisor edges was considered to be the minimum acceptable opening in an adult.

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#### 2.4. Collagen membrane graft<sup>5,6,10</sup>

1. A 10x10 cm, 0.06mm in thickness collagen membrane sterilized by ethylene oxide and available in vial format containing isopropyl alcohol and water as the preservative media was then adapted to the buccal defects created and then secured in place with horizontal mattress sutures.
2. The same procedure was performed on the other site.

#### 2.5. Release, mobilization of the Buccal Fat Pad graft<sup>1,3,4</sup>

1. An incision high in the maxillary vestibule, beginning above the second molar and extending posteriorly for 2cm. The incision is made 5mm above the attached gingiva of the second molar and extends through mucosa and then the fibres of the buccinator muscle to expose maxillary periosteum.
2. The Buccal Fat Pad was approached by bluntly opening the fine haemostat or scissor and then gently dissected until the fat protrudes into the mouth.
3. It was teased into the mouth gently by applying external pressure over the cheek until a sufficient amount was obtained to cover the defect without tension and was then secured in place with horizontal mattress sutures.
4. The same procedure was performed on the other site.

#### 2.6. Graft stabilization

The grafts on either side were then secured with Bismuth iodine paraffin paste (B.I.P.P.)<sup>11</sup> soaked gauze along with a prefabricated splint using transcutaneous sutures with 1-0 mersilk.

#### 2.7. Postoperative follow up

1. The patients were given with IV anti-toxins for a time of 5 days followed by oral for an additional 5 days. Intensive water system with povidone iodine 5%, saline and Chlorhexidine Gluconate 0.2% w/v 21 was done double a day for the postoperative time of around 15 days.
2. Ryle's cylinder taking care of was proceeded for a time of 10 days.
3. After 10 days postoperatively the support was eliminated.
4. Patients were begun on mouth opening activities (utilizing wooden sticks 9, Heister jaw opener 9,13) from the second postoperative day, with a recurrence of three times each day with term of thirty minutes, and later the recurrence and length was expanded to encourage improvement in the mouth opening until values that were accomplished intraoperatively.<sup>3,5</sup>

5. Patients were assessed for intra oral mending and mouth opening at timespans day, 14 days, multi month, 3months and a half year post-operatively.
6. All patients were endorsed supplement and against oxidant cases of Lycopene 5000mcg once daily 29 with effective triamcinolone acetonide 0.1% on mucosal surface at sleep time for least of a half year postoperatively.<sup>2,4,12,13</sup>

### 3. Results

This study was conducted on 10 patients aged between 19-35 years comprising of all male patients.

Out of 10 patients it was observed that the fibrosis in all the patients had mainly involved buccal mucosa and retro molar pad with 4 patients also showing involvement of orbicularis oris muscle.

The interincisal distance was chosen as the objective parameter to identify the severity of disease and measure the response to treatment after surgical intervention.

The mean and standard deviation of incisal opening (mm) for five patients in buccal fat pad graft group showed a mean of 18.8mm preoperatively with a standard deviation of 2.04. Intra operatively the mean value was 40mm and SD of 3.41. After a follow up period of 10 days the mean value was 37.6mm and SD of 2.24, the mean value at 1<sup>st</sup> month post-operatively was 35.4mm with a SD of 4.27, after 3 months post-operatively mean value was 32.2mm and SD of 5.23, after 6 months post-operatively mean value was 35.8mm and SD of 4.58.

The mean and standard deviation of incisal opening (mm) for five patients in collagen membrane group showed a mean of 17.6 mm preoperatively with a SD of 2.94. Intra operatively the mean value was 40mm and SD of 5.62. After a follow up period of 10 days the mean value was 37.0 mm and SD of 4.19, the mean value at 1<sup>st</sup> month post-operatively was 36.2mm with a SD of 5.49, after 3 months post-operatively mean value was 34.4mm and SD of 5.75, after 6 months post-operatively mean value was 35.0mm and SD of 5.93.

The students T value test comparing the mean and standard deviation of incisal opening in buccal fat pad graft group and collagen membrane group shows a T-value of 0.67 pre-operatively. Intra operatively the T value was 0. The follow up post-operatively showed a T value of 0.25 at 10<sup>th</sup> day, 0.31 at 1<sup>st</sup> month, 0.57 at 3<sup>rd</sup> month and 0.21 at 6<sup>th</sup> month. Hence the T-value indicates, there is no significant difference between buccal pad of fat group and collagen membrane group with respect to incisal opening for P = 0.

Healing of buccal fat pad graft and collagen membrane was assessed on criteria of granulation at day 14, epithelization at 1 month and contracture at 3 months by the aid of digital photography.<sup>9</sup>

Comparing healing in buccal fat pad graft group and collagen membrane group in terms of granulation at 14<sup>th</sup> day showed fair results in 3 patients of buccal fat pad graft group and 1 patient in collagen membrane group and good in 2 patients of buccal fat pad graft group 4 patients in collagen membrane group.

Epithelization at 1<sup>st</sup> month was fair in 3 patients of buccal fat pad graft group and 1 patient in collagen membrane group and good in 2 patients of buccal fat pad graft group 4 patients of collagen membrane group.

Wound contracture at 3<sup>rd</sup> month showed good results in 4 patients of both groups and fair results in 1 patient in both groups indicating less than 25% wound contracture in both the grafts.

The  $X^2$  value indicates a difference of 33.33 between buccal fat pad graft group and collagen membrane group at 14<sup>th</sup> day of granulation and 1<sup>st</sup> month of epithelization. There was no difference seen in  $X^2$  value at 3<sup>rd</sup> month post-operatively in both groups in terms of wound contracture.

The  $X^2$  value indicates a significance difference of between buccal fat pad graft group and collagen membrane group at 14<sup>th</sup> day and 1<sup>st</sup> month for  $P = 0.05$ .

Hence collagen membrane is better compared to buccal fat pad graft in terms of granulation and epithelization.

#### 4. Discussion

OSMF is a treacherous, devastating state of the mouth bringing about critical wellbeing and social issues, which may meddle with the ordinary review of the oral hole for malignancy, sufficient nourishing admission, dental cleanliness and speech.<sup>5</sup>

The clinical highlights of OSMF like exorbitant salivation, missing gustatory sensation and constraint of mouth opening prompts trouble in biting, gulping, explanation and helpless oral hygiene<sup>35</sup>. Its chronicity, optional muscle degeneration and fibrosis demonstrate a much extreme level of debilitation to the standard way of life of a man.

The cancer-causing capability of the sickness is frequently disparaged and in light of the fact that it is both normal and follows an ongoing course clinicians and patients will in general take it nonchalantly. Non-careful medicines have so far yielded conflicting outcomes consequently making the surgeries a superior choice. Careful treatment of extreme lockjaw in submucous fibrosis patients can improve enunciation, rumination, and oral cleanliness, which are socially and practically important.<sup>12,14</sup>

Various unions are accessible to cover the crude injury in agreement to writing are part thickness skin graft<sup>7</sup>, full thickness skin graft<sup>4,8</sup> island palatal flap,<sup>9</sup> two-sided tongue flap buccal fat pads<sup>4,15,16</sup> two-sided outspread lower arm free flap, nasolabial flap, temporalis pedicled flap,<sup>13,17</sup>

shallow temporalis sash pedicled flap<sup>7,15</sup> anterolateral thigh flap,<sup>11</sup> collagen sheets,<sup>17</sup> placental grafts,<sup>17</sup> allograft.<sup>18</sup>

Collagen is accessible as overlays, sheets, textures, gels, powders, and wipes and has been utilized as transitory dressing materials in consumes and ulcers. Collagen has likewise been utilized as a haemostatic agent, in ligament joining, and in the acceptance of bone arrangement. Adherence is a significant factor for the endurance of the collagen film in oral cavity. The adherence of the collagen layer might be an after effect of fibrin collagen connection yet is doubtlessly a consequence of fibrovascular development into the collagen membrane.<sup>18</sup> It takes 5 to 10 days for adherence.<sup>17,18</sup> All collagen films sloughed off with time. Disregarding debilitating of the collagen due to collagenolysis<sup>12</sup>, it opposed the masticatory powers for an adequate timeframe and permits solid granulation tissue to frame uniformly.<sup>17,18</sup>

Buccal fat cushion by uprightness of its anatomic position and the simplicity with which it tends to be gotten to and assembled without causing any perceptible imperfection in the cheek or mouth was felt to be dependable intervention material. The join can be drawn nearer through a similar buccal cut, which was utilized to deliver the fibrosis.

This examination reasoned that extraction of third molars, reciprocal coronoidotomy, masticatory muscle myotomy with the resection of sinewy groups is the favored careful administration for long haul results and counteraction of backslide as far as interincisal distance as there was no statistical distinction for T esteem between both the gatherings for  $P=0$ .

On examination of recuperating in both the gatherings, collagen layer gave quicker mending as far as granulation at fourteenth day, epithelisation at first month which was measurably critical with a chi square estimation of 33.33 for a P estimation of  $P=0.05$ . Twisted contracture at third month didn't show any distinction in both the gatherings. Thus due to wide region of inclusion, quicker mending and great patient acknowledgment collagen film filled in as a superior substitute to buccal fat cushion join. From our investigation we inferred that forceful careful administration with extraction of third molars, reciprocal coronoidotomy and masticatory muscle myotomy in stage III stage IV oral submucous fibrosis and reproduction with collagen layer followed by normal mouth opening activities gives great outcomes for long haul follow up periods.

#### 5. Source of Funding

None.

#### 6. Conflict of Interest

The authors declare that there is no conflict of interest.

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