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# RESEARCH ARTICLE

## COMPARISON B/W NASOLABIAL FLAP AND BUCCAL FAT PAD

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## ABSTRACT

**Background:** Oral submucous fibrosis (OSMF) is a chronic, progressive precancerous disorder leading to restricted mouth opening. Surgical release with reconstruction is required in advanced cases, with Buccal Fat Pad (BFP) and Nasolabial Flap (NLF) being commonly used. **Aim:** To compare the effectiveness of BFP and NLF in improving mouth opening and commissural width in OSMF patients. **Materials and Methods:** Twenty OSMF patients with interincisal opening <20 mm were randomized into two groups. Group 1 underwent fibrotomy with BFP grafting and Group 2 with NLF reconstruction. Pre- and postoperative mouth opening and commissural width were measured and statistically analyzed. **Results:** Both groups showed significant intragroup improvement. In the BFP group, mouth opening improved from 11.70 ± 1.79 mm to 26.51 ± 3.92 mm and commissural width from 43.10 ± 3.59 mm to 44.20 ± 3.53 mm. In the NLF group, mouth opening increased from 10.00 ± 4.01 mm to 32.00 ± 3.80 mm and commissural width from 42.10 ± 2.80 mm to 49.20 ± 4.60 mm. Intergroup comparison showed NLF provided greater improvement. **Conclusion:** Both techniques are effective, but NLF achieves superior functional outcomes, especially in advanced OSMF cases.



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## INTRODUCTION

The chronic, progressive, and scarring illness known as oral submucous fibrosis (OSMF) is typified by aberrant collagen deposition. Because of the eating of areca nuts, it is very common in South East Asia. OSMF is a precancerous condition with a 1.5–30% malignant potential (1–3). The majority of OSMF occurrences occur in middle-aged people, while pediatric OSMF is a more recent and difficult condition, accounting for 16.6% of cases in some western nations (4). Chewing Areca nuts, nutritional inadequacies, stress, and genetic predisposition are the most prominent causes of this complex etiology (1, 2, 5).OSMF treatment varies with stage, and early detection improves prognosis. The only way to control early detection is to stop the behavior. However, moderate to advanced stage disease may require medical and surgical intervention (6). Simple fibrous band excision, temporalis myotomy, coronoidectomy, buccal fat pad (BFP), NLF (Nasolabial Flap), skin grafts, free flaps, platelet-rich fibrin, temporalis fascia, platysma myocutaneous flap, and other procedures are all included in surgical therapy. Because BFP is easier to harvest and has fewer problems than NLF, most studies that compared the two produced equally satisfactory outcomes.(7) Palliation has always been the mainstay of treatment for OSMF, with the primary goals being to improve mouth opening and reduce symptoms. In more advanced phases, where surgical intervention is required, medicinal treatments are typically futile.(8) Surgery is extremely difficult for patients with severe trismus. Surgical techniques have changed over time, focusing on reconstructing the ensuing flaws after releasing the fibrotic bands. Reconstruction has been accomplished using a variety of grafts and flaps, such as nasolabial flaps, split-thickness skin grafts, radial forearm free flaps , buccal fat pad grafts , bilateral tongue flaps , and island palatal mucoperiosteal flaps.(9-10)

The purpose of this study is to evaluate the effectiveness of Nasolabial Flap (NLF) and Buccal Fat Pad (BFP) surgical approaches for treating oral submucous fibrosis. The main goals are to assess oral commissural breadth and postoperative mouth opening after these procedures. According to the null hypothesis, there is no discernible difference between the two surgical methods.

# MATERIALS AND METHODS

Study Design, Setting, and Duration: This research was conducted as a randomized, prospective, interventional study featuring a parallel group design with a balanced allocation ratio of 1:1.

**Eligibility Criteria:** Twenty Patients with an interincisal mouth opening of less than 20 mm who had been clinically

diagnosed with oral submucous fibrosis and were encouraged to give up unhealthy behaviors were included. Patients in medically compromised conditions, those unable to give informed consent, those with systemic disorders that contraindicate general anesthesia, and those presenting with alternative clinical or radiological causes of trismus were also excluded.

**Procedure:** Clinical and histological screenings for OSMF were performed on patients who complained of burning feelings, restricted mouth opening, sensitivity to spicy meals, or a combination of these symptoms. A pre-made proforma was used to standardize the data collection process. Every participant gave their informed consent. At baseline, photographic documentation was completed. Through a lottery procedure, participants were randomly assigned to one of two groups: Group 1 received buccal fat pad graft treatment, whereas Group 2 got surgical management utilizing the nasolabial island flap. Prior to surgery, standard hematological tests and histological evaluations were carried out. One skilled surgeon used fiberoptic nasotracheal intubation to do all procedures under general anesthesia. Bilateral intraoral incisions were made at the buccal mucosa level using a number 15 blade and electrocautery, avoiding the Stenson's duct orifice, following the infusion of local anesthetic with 1:200,000 adrenaline along the prearranged incision lines. Depending on the degree of fibrosis determined by palpation, the incision was made from the oral commissure anteriorly to the anterior pillar of the fauces, soft palate, or pterygomandibular raphe posteriorly. Until all fibrous limitations were removed, blunt dissection and undermining were carried out.

**Buccal Fat Pad Graft Reconstruction:** The buccal fat pad was reached via the posterosuperior margin of the defect following the removal of the fibrous band and sufficient mouth opening. To hide the defect without creating strain, the fat pad was carefully removed using blunt dissection and fastened with a mattress. 3-0 Vicryl sutures

**Nasolabial Flap Reconstruction:** Third molars were extracted once fibrous bands were removed and sufficient mouth openness was achieved. Methylene blue was used to mark the design of an elliptical nasolabial flap that ran from the tip of the nasolabial fold to the mandibular border. The width of the flaps tapered at the ends and varied from 1.5 to 2 cm. With a 1.5–2 cm pedicle preserved close to the oral commissure, the flap was raised in the plane of the superficial musculoaponeurotic system. After creating a transbuccal tunnel close to the modiolus, the flap was moved tension-free into the mouth. 3-0 Vicryl sutures were used to attach the flap edges to the defect margins. Subcutaneous undermining and layered closure with 3-0 vicryl and 4-0 ethilon sutures were used to close the donor site. Following surgery, patients were monitored on days 7, 15, 30, and 90. Antibiotics were regularly given as a preventative measure. In Group 1, extraoral sutures were taken out seven to ten days after surgery. In order to restore intraoperative mouth opening, patients in both groups started intense physical therapy after the tenth day, progressively increasing the frequency and length of Heister's mouth gag exercises. For six months, patients were encouraged and taught to continue their physiotherapy on their own. At every follow-up appointment, the interincisal mouth openness was measured in millimeters using a ruler.

# RESULTS

**Table 1. Mouth Opening and Commissural width in Buccal Fat Pad**

| | | Mean ± Std.Deviation | P value |
|---|---|---|---|
| Mouth Opening | Pre | 11.70±1.79 | 0.001* |
| | Post | 26.51±3.92 | |
| Commissural Width | Pre | 43.10±3.59 | 0.01* |
| | Post | 44.20±3.53 | |

*statistically significant results

**Table 2. Mouth Opening and Commissural width in Nasolabial Flap**

| | | Mean ± Std.Deviation | P value |
|---|---|---|---|
| Mouth Opening | Pre | 10.00±4.012 | 0.001* |
| | Post | 32.00±3.8 | |
| Commissural Width | Pre | 42.10±2.8 | 0.001* |
| | Post | 49.20±4.6 | |

*statistically significant results

Both groups showed significant intragroup improvement in mouth opening and commissural width postoperatively. In the BFP group, mouth opening increased from 11.70 ± 1.79 mm to 26.51 ± 3.92 mm, while in the NLF group, it increased from 10.00 ± 4.01 mm to 32.00 ± 3.80 mm. Commissural width improved modestly in the BFP group (43.10 ± 3.59 mm to 44.20 ± 3.53 mm), whereas a greater increase was noted in the NLF group (42.10 ± 2.80 mm to 49.20 ± 4.60 mm). Intergroup comparison indicates that although both techniques are effective, the Nasolabial Flap (NLF) provided superior functional outcomes, with greater postoperative gains in both mouth opening and commissural width compared to the Buccal Fat Pad (BFP). (Table 1&2).

# DISCUSSION

He present study compared the efficacy of the Buccal Fat Pad (BFP) and Nasolabial Flap (NLF) in improving mouth opening and commissural width in patients undergoing surgical management. Both groups demonstrated statistically significant intragroup improvement, highlighting the effectiveness of both reconstructive techniques. However, intergroup comparison revealed that the NLF provided greater functional gains than the BFP. In the BFP group, postoperative mouth opening increased from 11.70 ± 1.79 mm to 26.51 ± 3.92 mm, and commissural width improved modestly from 43.10 ± 3.59 mm to 44.20 ± 3.53 mm. These results confirm the usefulness of the BFP as a reliable intraoral flap, with advantages including ease of harvest, rich vascularity, minimal donor site morbidity, and adequate coverage of intraoral defects. However, its limited reach and relatively small contribution to commissural widening may explain the modest improvement in commissural width. In contrast, the NLF group showed a more pronounced improvement, with mouth opening increasing from 10.00 ± 4.01 mm to 32.00 ± 3.80 mm and commissural width from 42.10 ± 2.80 mm to 49.20 ± 4.60 mm. The greater enhancement achieved with the NLF can be attributed to its robust vascularity, wide arc of rotation, and ability to extend beyond intraoral boundaries, thereby providing both functional and aesthetic benefits. In a prospective two-year study, Pravin Lambade *et al*. 2016 (11) included 20 OSMF patients who had fibrotomy defect restoration with NLF and had mouth openings less than 16 mm. After two years, postoperative follow-up showed mouth

openings ranging from 20 to 44 mm, while intraoperative mouth openings varied from 32 to 44 mm. Prominent intraoral hair growth and obvious extraoral scars were among the early surgical consequences. Comparably, Qayyum MU *et al*. 2018 (12) documented preoperative mouth openings ranging from 5 to 16 mm that grew to 29 to 39 mm at six months postoperatively when discussing the use of nasolabial and extended nasolabial flaps for oral defect restoration in OSMF. Although certain issues were noted, including as inadequate scarring and flap stress from wisdom teeth, these were successfully treated. A study by Saravanan *et al*. (2012) (13)documented eight OSMF cases that received BFP grafts. Following coronoidectomy, patients who had preoperative mouth openings between 3 and 18 mm were able to obtain postoperative apertures between 25 and 38 mm. The range of postoperative mouth openings was 25–36 mm. Within three to four weeks, the grafts epithelialized and healed without incident.

The scientists came to the conclusion that the BFP's anatomical location, abundant blood supply, and simplicity of harvest and mobilization make it an appropriate interpositional transplant. Our findings are supported by a number of earlier investigations. Comparable outcomes were noted by Lathi *et al*. (2022) (14) and Anehosur *et al*. (2020).(15) Lathi *et al*. reported a mean increase in incisal opening postoperatively of 22.9 mm and an increase in intercommissural width of 7.4 mm after NLF, while the BFP group experienced a mean increase in mouth opening of 15.7 mm with a negligible change in commissural width. They came to the conclusion that NLF was the best interpositional material for reducing relapse in stage IV OSMF cases, saving BFP for stage III instances. Significant postoperative increases in commissural width and interincisal mouth opening were seen by Anehosur *et al*., favoring the NLF group over the BFP group (14,15).

On the other hand, research by Sikkerimath *et al*. 2020 (16) and Rai *et al*. 2013 revealed different results, with BFP producing superior effects. Rai *et al*. found no discernible variations in commissural widths, with mean postoperative mouth openings of 32 mm for NLF and 29 mm for BFP groups. They observed increased rates of NLF complications, such as temporomandibular joint displacement, mouth commissure widening, and partial flap necrosis. BFP prevented problems like intraoral hair growth and extraoral scars. Sikkerimath *et al*. found that BFP produced better results in terms of mouth opening and complications after reporting postoperative mouth openings of 40 mm and 34.7 mm for the BFP and NLF groups, respectively.

# CONCLUSION

Both the Buccal Fat Pad and Nasolabial Flap significantly improved mouth opening and commissural width following surgical management. While the Buccal Fat Pad provided satisfactory results with minimal donor site morbidity, the Nasolabial Flap demonstrated superior functional outcomes, particularly in terms of greater gain in mouth opening and commissural widening. Thus, the Nasolabial Flap may be considered the preferred option in cases requiring more extensive correction, whereas the Buccal Fat Pad remains a reliable alternative for smaller intraoral defects. Further studies with larger cohorts and long-term follow-up are warranted to validate these findings and establish definitive clinical guidelines.

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