

## ORAL SUBMUCOUS FIBROSIS - NEW DIMENSIONS IN SURGERY

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**ABSTRACT:** *The oral submucous fibrosis (OSMF) has been managed earlier by various medical and surgical modalities but none of these methods is found to give relief to these patients. Hence, a new method has been developed by us. Patients, who reported with pallor of the palate, cheek, oropharynx and the tonsils, due to the fibrosis, leading on to mild, moderate to severe trismus, were given a good long-term relief by this surgical method. This study involved 60 patients between 1979 and 2000 with a female-to-male ratio of 1 : 3 with age ranging from 13 to 60 years suffering from the disease. The surgical method adopted in these cases used a single staged rotation tongue pedicle flap on either side from the dorsum of the tongue sutured to the raw area in the cheek, without morbidity. In a 7-year follow up, we found the patients did not develop further fibrosis and the tongue flaps remained intact. The quality of life improved considerably and buccal mucosa is pink throughout the follow-up period. The modalities of treatment adopted are varied. Many tried the retro molar excision of the bands, which did not give long-term results. Others used excision of the whole fibrotic area with skin grafting, which also failed. Some have tried muscle pedicle flap from outside with postoperative morbidity and failure. Some surgeons have tried fat grafts in the cheek region (Yeh, Int J Oral Maxillo facial Surg 1996;25:130). The experience of the others who used versatile, vascular tongue flaps in the oral cavity after cancer clearance, prompted us to attempt this new technique in the present series with gratifying results. This is a break through in the surgical management of OSMF, where other treatment modalities failed.*

**Key Words:** *Oral submucous fibrosis (OSMF), pedicled tongue flap*

The oral submucous fibrosis (OSMF) is a disease with uncertain etiology that is often encountered in practice in India.<sup>[1]</sup> It is one of the precancerous conditions leading to carcinoma of cheek.<sup>[2]</sup> It is caused by chewing irritants like tobacco, betel leaf with lime, and areca nut.<sup>[3]</sup> These substances trigger the synthesis of collagen, tough fibrinous protein that stiffens the soft mucous membrane and muscles of the oral cavity. The tongue being highly vascular usually escapes. The mouth size shrinks in extreme cases, only a button size opening is left.<sup>[4]</sup> There is scarring with atrophy of the mucous membrane and pain during swallowing, preventing the patient to enjoy a meal. The atrophic mucous may ulcerate often, and subsequently may lead to malignancy.<sup>[1,2]</sup> We have evolved and adopted an aggressive and decisive protocol for the management of these patients. It includes excision followed by single stage bilateral pedicled tongue flap, covering the raw area created by excision of the cheek mucosa and followed by supportive therapy with antioxidants.<sup>[5-8]</sup> The pedicle tongue flap from time immemorial has been commonly used for covering defects following surgery for carcinoma of cheek, palate, floor of the mouth, tonsillar fossa, posterior pharyngeal wall, and hypopharynx.<sup>[9]</sup> Tongue muscle as used as free graft for these defects.<sup>[5,10]</sup> Depending upon the site to be

reconstructed, the tongue flap can either be from the anterior 2/3 or posterior 1/3 of the tongue.<sup>[5,11]</sup> Once these flaps have taken up, after a period of time, the pedicle is divided from the original base. This necessitated a two-stage procedure. But in cases of OSMF treated by us, a single-staged posteriorly based flap procedure was used and the pedicle retained to maintain the vascularity of the cheek.

Most of the studies have been undertaken at different centers in India to define the etiology of the disease, which is on the increase. Despite the huge amount of work done to establish the etiopathogenesis, it still remains to be a mystery in all aspects.<sup>[12]</sup> The majority of patients in our study are habituated to chewing betel nut, lime, tobacco, and betel leaf, in the form of quid and keep the same in the buccal cavity. The constant irritation caused the pathological changes in the mucous membrane leading to OSMF. The cases in this study showed chewing habits as the significant cause and in a small number, auto immune and genetic factors, play a role.<sup>[13,14]</sup>

### MATERIALS AND METHODS

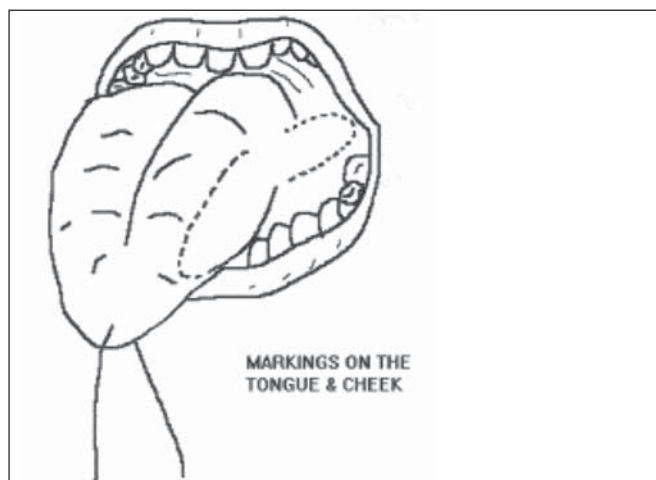
A total of 60 patients participated in the study from 1979 through 2000. There were 42 men and 18 women with age

ranging from 13 to 60 years. Furthermore, the mean year of duration of the disease ranged from 10 to 15 years. The inclusion criteria of patients were the presence of OSMF involving the cheeks, the soft palate, pillars, tonsils, and pharynx with or without trismus. The inter-incisor space is measured in every case before and after surgery, which is the parameter for the assessment of the surgical result. Patient's characteristics are the presence of extensive white fibrosis of the cheeks and palate. Sometimes the pillars, tonsils, and pharynx are involved. In rare cases, the tongue is involved showing loss of papillae and ironed out which are not taken up for study.<sup>[9]</sup> Normally, the tongue appears pink in contrast and shows normal mobility. Some patients have normal opening of the mouth, who complain of burning sensation while eating food and recurrent ulcers in the cheek. For such cases, as a prophylactic measure, surgery has been performed and they did well in the follow up for years. Some patients have mild, moderate, and severe trismus, who cannot open the mouth have to push the morsel of food with fingers, which is a pathetic sight to see. They look emaciated and anemic. In a study of such patients, we have proved that they can enjoy the food and the quality of life has improved which is incredible. The study has proved that in majority of cases the habits of chewing betel nut, lime, and tobacco play an important role in the etiopathogenesis of the disease. In others, who deny such habits, genetic factors, and auto-immunity could possibly be a causative factor to be reckoned.<sup>[1,3,13,14]</sup>

### Geographic distribution

In this study following is the distribution of the patients seen, who have reported to our hospitals from various states of the Indian sub-continent.

Uttar Pradesh: 7; Assam: 15; West Bengal: 12; Tamil Nadu: 11; Andhra Pradesh: 9; Madhya Pradesh: 6.



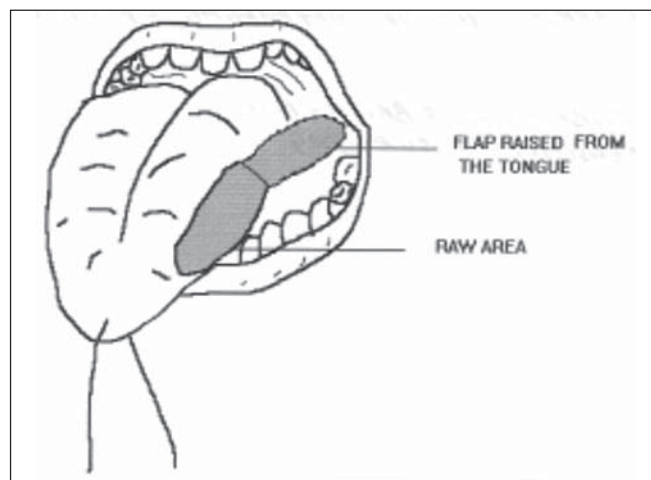
**Figure 1:** Markings on the tongue and cheek

### Surgical highlights

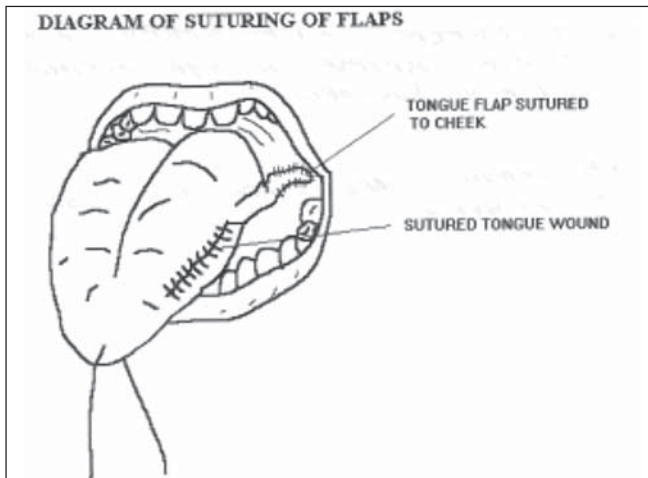
Patients are evaluated for fitness to general anesthesia. Some patients with marked trismus are difficult candidates for endotracheal intubations. For such patients, the anesthetist after induction uses flexible fiber optic laryngoscope to introduce the endotracheal tube and tracheotomy is avoided. Preoperatively in some patients, who have mild trismus, the dentist extracts the last upper and lower molars to prevent the tongue flap getting in the way of occlusion, division of which may result in profuse bleeding during mastication.

A nasogastric tube is passed by the anesthetist and the patient is placed in supine position with the head elevated to 30° with the mouth wide open with a Doyen's gag. The tongue is anchored down with a 00 silk suture at the tip. At the first instance, in cases of severe trismus, the dental surgeon coordinates during surgery to extract the last two upper and lower molars. To give good inter-dental working space, the anterior pillar and retromolar fibrotic bands are incised with a knife. On the dorsolateral aspect of tongue, using indelible marking in, a mark is made starting half of an inch from the anterior pillar of the palate, parallel to the midline of the tongue up to 1 cm behind the tip of the tongue [Figure 1]. The marking is taken down inferiorly to the sublingual surface up to the last molar, which includes the lateral margin of the tongue. Another elliptical marking is made on the cheek starting from the palatoglossalfold to 2 cm behind the angle of the mouth. The tongue is infiltrated with saline and epinephrine injection. Then a deep elliptical tongue flap is raised up to the palatoglossalfold within the markings on the tongue, which includes the tongue epithelium and muscle, using knife and scissors and cutting cautery [Figure 2].

Bleeding points are coagulated with diathermy to establish complete haemostatics. The incision in the tongue is closed with a deep and superficial 000 vicryl suture material. The



**Figure 2:** Raising the flap from the dorsolateral aspect of the tongue



**Figure 3:** Diagram showing suturing of flaps

tongue flap is raised and rotated outward laterally to the raw area after excision of the lesion in the cheek. A deep suture is placed in the bed of the flap, which is firmly anchored with 000 vicryl to the raw area in the cheek. The margins of the tongue flap and edges of the cheek wound are firmly anchored with interrupted sutures [Figure 3]. The same procedure is adopted on the contralateral side. The flap is found snugly fitting as the molars are removed without affecting the occlusion. The oral cavity is flushed with betadine and metrogyl solution.

Post-operatively a course of antibiotics, intra-venous fluids for next 12 hours, anti-inflammatory drugs and cold sponging to the cheeks is advised for the next 48 hours. The patient is discharged on the fourth day and advised to take bland nonspicy oral feeds starting with liquids initially and then semi-solids gradually. Physiotherapy is advised by using constantly graduated hypodermic syringes ranging from 5, 10 and 20 cm<sup>3</sup> to bite on the barrel of the plastic syringe to prevent trismus. In the long-term treatment patient is advised iron replacement and antioxidants for 6 months and over. Postoperative picture is shown in Figure 4.

About 50 of our patients, who underwent this type of procedure for the treatment of OSMF, were put on long-term antioxidants therapy postoperatively.<sup>[11,13]</sup> Two patients had their flaps severed, which required resuturing. All patients who had severe trismus preoperatively are relieved following pedicled tongue flap surgery. Patients neither experienced any difficulty with articulation or deglutition, nor did they experience any loss of taste. The quality of life is improved. All patients who had a 5-year long-term follow up showed relief of the trismus, improved vascularity and no progression of the disease.

## DISCUSSION

The posteriorly based tongue flap surgery is difficult as compared to anteriorly based flap. The most difficult part of surgery is anchoring the pedicled tongue flap in the raw area created in the cheek after excision of the scarred mucous layer and stitching all around in the narrow limited space. The plastic surgeon's help is sought in this step. The coordinated effort has an added advantage in terms of morbidity to the patients and time factor. We have observed in the series that oral submucous fibrosis did not involve the tongue, which is highly vascular, and surprisingly the esophagus is spared. We have rejected cases with extensive ulceration and malignant changes. We have operated cases with severe trismus and also on cases with mild, moderate or without trismus, as a prophylactic measure. Dorsolateral posteriorly based tongue flap surgery is very difficult and experience is vital to achieve good results. Earlier we used pedicled flap from the dorsal aspect of the tongue, which was given up due to some inherent problems. We adapted the dorsolateral flap, which is easy to rotate laterally to the cheek bed without interfering with the blood supply, which may result in atrophy of the flap. The lateral tongue flap is advantageous due to its mobility, elasticity, vascularity, and location.<sup>[15]</sup>

Being viable and resistant to submucous fibrosis, this flap has high success rate in take-up, and in relieving and preventing further trismus. The postoperative mobility of the tongue and articulation becomes normal in about 4-6 weeks and dulling of taste sensation is negligible. The reduction in the bulk of the tongue is regained with tongue movements and exercises. Removal of the last two upper and lower molars by the dentist either before or preoperatively is mandatory. It has an added advantage in preventing severance of the flap, bleeding, and traumatic ulceration during mastication. Initially



**Figure 4:** Postoperative picture after 6 months showing submucous fibrosis of palate and transposed tongue flaps, well taken up with adequate inter-incisor space

we attempted surgery on one side and if the flap take-up was good, we switched on to the other side after 3 months. Now in the present series we do flap surgery on both sides in the same sitting, which is cost effective, and it has less morbidity also cuts down the number of postoperative visits. In follow-up cases after 1 year, we have observed islands of vascularization around the area of the flaps and no further progress of submucous fibrosis. Few biopsies from these areas have shown budding of vessels in the fibrosed area, which needs further observation in the future. Moreover, the surgery does not address the disease but it definitely relieves the trismus, the general well being of the patients improves and patients enjoy the food without any alteration in taste sensation. Further the patients are advised medical treatment with antioxidants as a dietary supplement. They are advised to refrain from spicy food, irritants like pan masala, supari, and tobacco. In established cases of oral submucous fibrosis of our series, there was no salvation for the patients and steroid injections and other modalities had no place except the pedicled tongue flap surgery, with excellent and very gratifying results.

## CONCLUSION

Excision of the lesion, with reconstruction using single-staged pedicle flap followed by antioxidants therapy, achieved a better success rate especially in the management of trismus and in the prevention of development of invasive carcinoma. The OSMF is a crippling disease of unknown etiology and is a legacy of the sub-continent. Although there are various modalities of treatments, pedicled tongue flap surgery has given comparatively promising results.<sup>[12]</sup> Especially in a country like ours, where the incidence of OSMF is high due to habitual chewing of betel nut and tobacco with lime, such a well-formulated protocol as followed by us is of great benefit.

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