

# Diode Laser as a Treatment for Oral Submucous Fibrosis- A Case Report

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## ABSTRACT

**Introduction:** Oral submucous fibrosis is a chronic debilitating disease of the oral cavity characterized by inflammation and progressive fibrosis of the submucosal tissues leading to restricted mouth opening. The most common surgical procedure is excision of the fibrotic bands. Due to limited range of mouth opening bleeding during the procedure increases lack of accessibility and visibility. Diode Laser has proved to overcome these problems than any other conventional procedures.

**Method:** Treatment started following preoperative evaluation and review of the initial histopathological diagnosis. The excision of the bands using diode laser 5 W per square centimeter renders a definitive tool for the procedure .

**Results:** There was minimal bleeding, postoperative pain, swelling and discomfort.

**Conclusion:** This case report illustrates the usefulness of diode laser giving a hemostatic effect and thus proves suitable for the surgical treatment of oral submucous fibrosis.

**Keywords:** Oral Submucous Fibrosis, Diode laser, Fibrotic Bands, Hemostatic

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**Ethical Clearance :** Cleared

## INTRODUCTION

Lasers are becoming one of the standard care for many oral and maxillofacial procedures, and they are being introduced as an efficient modality for many applications today. Diode lasers which have a wavelength ranging from 805nm-980nm can be used in gated or continuous pulse modes[1]. Many oral cancers are preceded by pre-invasive states and are clinically diagnosed as distinct lesions[2]. The ability to reduce these lesions depends upon improved understanding and efficient management. Marley et al[3,4] previously reported the lack of widely accepted criteria for the management of oral lesions, decision making ultimately depending upon the individual clinical preference.

The treatment of patients with oral submucous fibrosis depends on the degree of clinical involvement. Most patients with oral submucous fibrosis present with moderate-to-severe disease. Moderate-to-severe oral submucous fibrosis is irreversible. Surgical treatment is indicated in patients with severe trismus and/or biopsy results revealing dysplastic or neoplastic changes. Surgical modalities that have been used include

1. Split-thickness skin grafting following bilateral temporalis myotomy or coronoidectomy[5].
2. Excision of the fibrotic bands and grafting with split thickness skin graft , buccal pad of fat, nasolabial flaps, lingual pedicle flaps, temporalis fascia[6] , followed with bilateral myotomy or coronoidectomy, if adequate opening is not achieved.

The aim of this case report was to review the clinical progress of patient with oral submucous fibrosis who underwent diode laser excision and regular follow up. In this way the progress of the clinical status and the efficacy of intervention by diode laser in the management of oral submucous fibrosis was also assessed.

## METHOD

5 patients (1 female , 4 male) reported to the hospital with oral submucous fibrosis having marked rigidity, fibrotic bands and an eventual inability to open the mouth[5] . All the treatments had been instituted following preoperative evaluation and review of the initial histopathological diagnosis. The mouth opening was measured preoperatively. The mouth opening for these patients were on an average of 20mm. (Fig. 1) The patients were selected for diode laser treatment based on the fibrotic bands present.



**Figure.1 :Pre Operative Mouth Opening**

Diode laser excision was carried out within 2 weeks of biopsy under general anaesthesia. Initially a pulse mode was used to

mark to outline the incision line . The pulse marks were then connected using the diode laser 5 W per square centimeter in continuous mode deepening to approximately 5mm in the submucosal plane.Further dissection was done with conventional method.(Fig.2, 3,4)

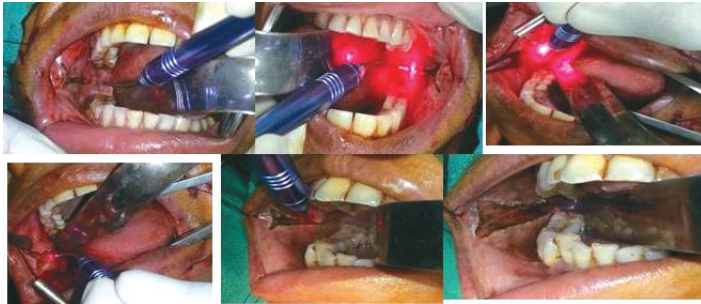


Figure.2 :Diode Laser used in Pulse and Continuous Mode.



Figure.3 : Conventional Dissection.



Figure.4 :Post Operative Wound Healing and Mouth Opening.

## RESULTS

There was minimal bleeding, postoperative pain, swelling and discomfort. The mouth opening after treatment was measured to be 35mm on an average postoperatively. (Fig. 4) The comparison of pre operative and post operative mouth opening of all

patients were assessed and is shown in the Table.1.

**Table.1 :Comparison of Pre & Post Operative Mouth Opening**

Patient no.	Pre operative mouth Opening	Post operative mouth Opening
1.	22mm	34mm
2.	20mm	35mm
3.	23mm	33mm
4.	24mm	34mm
5.	22mm	35mm

The total treatment procedure was approximately 20 minutes. After excision of the fibrotic bands , grafting with split thickness skin graft was done in ceratin cases. There was no recurrence of bands in 3 months follow up .

## DISCUSSION

Oral submucous fibrosis is a chronic debilitating disease of the oral cavity characterized by inflammation and progressive fibrosis of the submucosal tissues (lamina propria and deeper connective tissues).The buccal mucosa is the most commonly involved site, but any part of the oral cavity can be involved, even the pharynx[7,8,9].The condition is well recognized for its malignant potential and is particularly associated with areca nut chewing, the main component of betel quid. Betel quid chewing is a habit practiced predominately in Southeast Asia and India that dates back for thousands of years. It is similar to tobacco chewing in westernized societies. The mixture of this quid, or chew, is a combination of the areca nut (fruit of the Areca catechu palm tree, erroneously termed betel nut) and betel leaf (from the Piper betel, a pepper shrub), tobacco, slaked lime (calcium hydroxide), and catechu (extract of the Acacia catechu tree)[7]. Lime acts to keep the active ingredient in its freebase or alkaline form, enabling it to enter the bloodstream via sublingual absorption. Arecoline, an alkaloid found in the areca nut, promotes salivation, stains saliva red, and is a stimulant. The ingredients and nomenclature of betel quid vary by region as detailed below [10,11].

1. Pan: This is freshly prepared betel quid (with or without tobacco).
2. Gutka This is a manufactured version of betel quid with
3. Pan masala: This is a commercially manufactured powdered version of betel quid without tobacco .
4. Pan Parag: It is a brand name of pan masala and gutka .
5. Mawa This is a crude combination of areca, tobacco, and lime.
6. Mainpuri tobacco:, Mainpuri tobacco is a mixture of areca nut, tobacco, lime, and various condiments.

The pathogenesis of the disease is not well established, but the

cause of oral submucous fibrosis is believed to be multifactorial. A number of factors trigger the disease process by causing a juxtaepithelial inflammatory reaction in the oral mucosa. Factors include areca nut chewing, ingestion of chilies, genetic and immunologic processes, nutritional deficiencies, and other factors.

Treatment for OSF includes conservative medical treatment for mild impairment and surgical excision of fibrotic bands for trismus. Surgical excision with a pedicled buccal pad of fat graft has been shown to be a better choice for treatment than split-thickness skin or fresh amnion grafts, because it shows less wound contraction at 2 years of follow-up[12].

### CONCLUSION

Laser technology has made rapid progress over few past decades, and lasers have found a niche in many surgical specialties. Because of their many advantages, diode lasers have become indispensable in OMF surgery as an additional modality for surgery. There are many uses for lasers in OMF surgery, and the advent of new wavelengths will undoubtedly lead to new procedures that can be performed with laser technology.

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