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ABSTRACT

Objective: To assess the outcome of different surgical treatment modalities of Oral Submucous Fibrosis.

Background: Oral Submucous Fibrosis (OSF) is a persistent, progressive, pre-cancerous condition of the oral mucosa, which is mainly related with betel quid chewing habit. OSF is strongly connected with the risk of oral cancer. Since decades, many treatment modalities are suggested and studied like medicinal treatment, intralesional injection and physiotherapy or surgical treatments with varying degrees of benefit. But complete eradication of disease is challenging. The present article shows the outcome of various surgical treatment modalities in the management of this condition.

Method: In this article a total of 4 patients who were clinically and histologically diagnosed as Oral Submucous Fibrosis, grouped according to classification system for the surgical management of OSF proposed by Khanna JN and Andrade NN. Out of 4 patients 1 patient undergone fibrectomy with collagen membrane placement, 1 patient undergone fibrectomy with buccal fat pad placement, in 1 case fibrectomy was done with Laser, in advanced cases coronoidectomy was done.

Conclusion : In oral submucous fibrosis Fibrectomy followed by grafting is a one of the suggested treatment for prevention of the recurrence of the condition but advanced procedure like coronoidectomy gives better results related to the clinical mouth opening.

Keywords: Oral Submucous Fibrosis, surgical treatment, collagen membrane, laser, buccal fat pad, coronoidectomy

INTRODUCTION:

Oral submucous fibrosis is a condition with chronic inflammatory reaction in the subepithelial tissue of the oral cavity which leads to increased fibroelastic changes and epithelial atrophy by causing both increased collagen production and decreased collagen breakdown, results in stiffness of oral mucosa. Geographically, oral submucous fibrosis has a specific distribution and affects predominantly Asians (and particularly Indians)^{1,2} with the frequency of malignant change from 3% to 6%.^{7,8}

It is characterized by stiffness, trismus, burning sensation in the mouth, hypomobility of tongue and soft palate and inability to eat³. The prevalence of OSF cases in India has been reported to be with a female to male ratio of 3: 1.2⁴. Treatment in stage I and stage II oral submucous fibrosis includes medicinal treatment (vitamins & iron supplements), intra-lesional injections of hyaluronidase^{5,6} and steroid application. Surgery has been proposed in stage III and stage IV⁷ for effective release of trismus. Though these surgeries gave good results, decrease in inter-incisal opening in the long term follow up was seen

due to recurrent fibrosis, poor patient compliance, discontinuing physiotherapy or restarting of the habit⁷

Aetiology: OSF is multifactorial in origin, chewing of betel nut, consumption of spicy food, nutritional deficiency, hereditary, collagen and autoimmune disorders, but it is accepted that betel nut chewing is the main cause of this condition⁸.

The chewing of betel quid (BQ) (containing areca nut, tobacco, slaked lime or other species) has been recognized as one of the most important risk factors for OSF as supported by the epidemiological evidence^{9,10} as well as from its histopathological effects on fibroblasts and keratinocytes^{11,12}.

Clinical presentation: Initially, most patients present with a burning sensation or intolerance to spicy food, and they may have vesicles, particularly on the palate. Ulceration and dryness of the mouth is later followed by fibrosis of the oral mucosa, which leads to rigidity of the lips, tongue, and palate, and pain on palpation and trismus is caused mostly by fibrosis in the dense tissue around the pterygomandibular raphae. When the

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fibrosis involves oesophagus, patients may experience dysphagia usually these are features of more advanced disease. The most obvious clinical signs include blanched, opaque oral mucosa with palpable fibrous bands. All the four cases have chief complaint of restricted mouth opening and most of the patients have history of betel nut chewing since 5 to 10 years. All the patients were in the age group of 20 years to 40 years. Clinical evaluation of this condition and grading was done and incisional biopsy was taken from the most

affected site. In all the 4 cases fibrectomy was done by placing Y- shaped incision on the buccal mucosa on the occlusal level approximately 7mm below the stenson's duct. Out of four cases, in one case fibrectomy was done with Laser and no graft material was placed (Fig.2) , and the other three cases were done with scalpel followed by collagen membrane placement (Fig.1-d) or buccal fat pad grafting (Fig.3), and in severe case coronoidectomy (Fig. 4) was performed to achieve better results

Fig. 1 Shows surgical treatment of Fibrectomy with Collagen Membrane grafting



Fig. 1 (a) Pre-operative mouth opening: 7 mm



Fig. 1 (b) Intraoperative mouth opening: 38mm



Fig. 1 (d) Postoperative mouth opening: 22mm



Fig. 1 (c) Collagen Membrane placed

Fig. 1 Clinical Photographs of Surgical Treatment of Fibrectomy with Collagen Membrane grafting (a) preoperative (b) (c) (d)

Patient-2 : shows Fibrectomy done with Laser

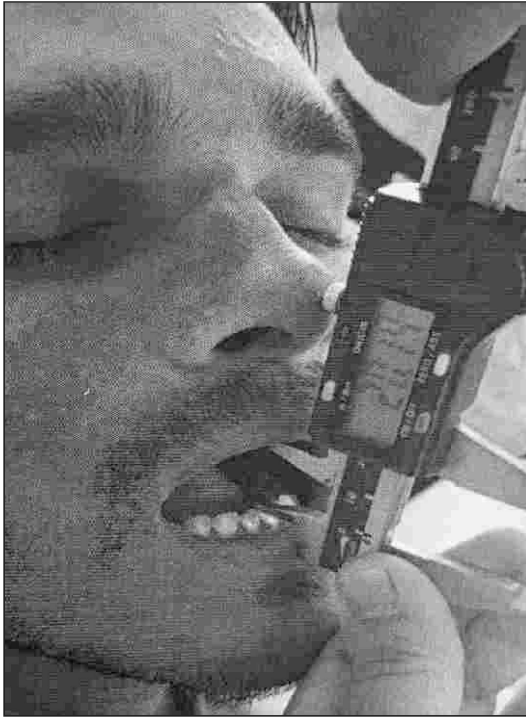


Fig. 2 (a) Pre operative mouth opening : 20mm

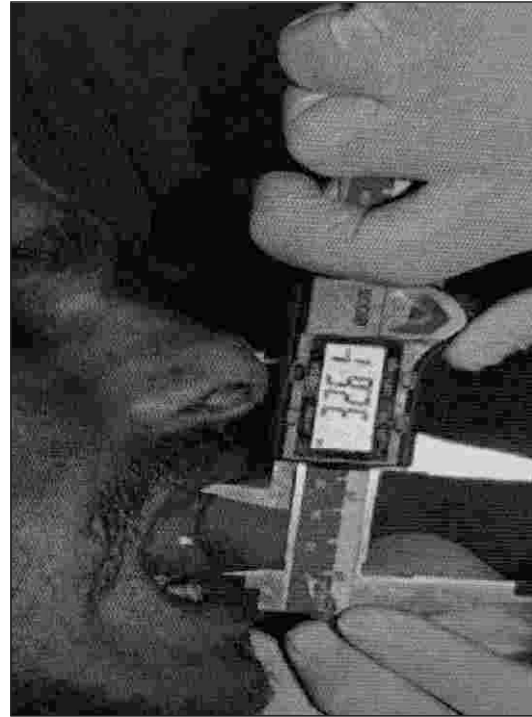


Fig. 2 (c) Intraoperative mouth opening 32 mm



Fig. 2 (d) Postoperative mouth opening: 42mm

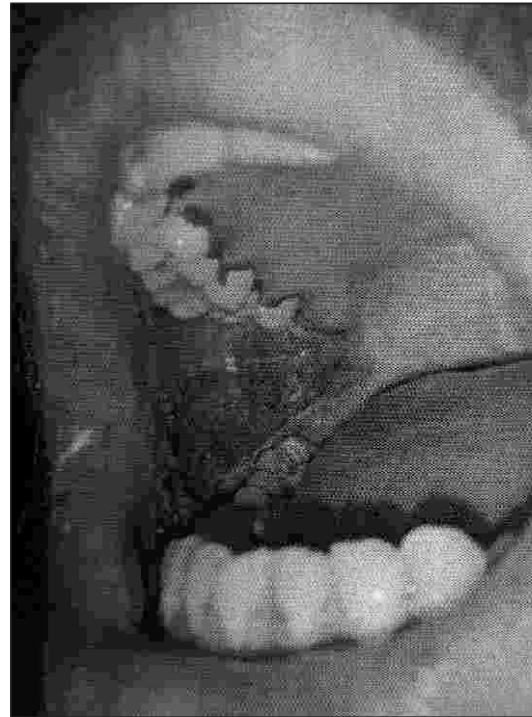


Fig.2 (b) Fibrectomy with Laser

Fig.3 Shows fibrectomy done with Buccal Fat Pad



Fig. 3(a) Preoperative mouth opening: 17mm



Fig.3(b) Intraoperative mouth opening: 34mm



Fig.3(d) Postoperative mouth opening 22mm



Fig.3 (c) Buccal Fat Pad placed on operated site

Fig.4 Shows Fibrectomy with Coronoidectomy



Fig. 4 (a) Preoperative mouth opening: 7mm

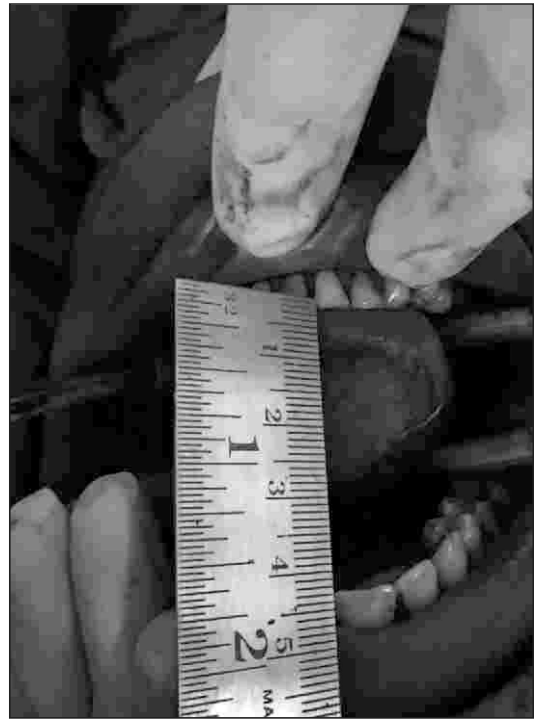


Fig.4 (c) Intraoperative mouth opening: 42mm



Fig.4 (d) Postoperative mouth opening: 25mm

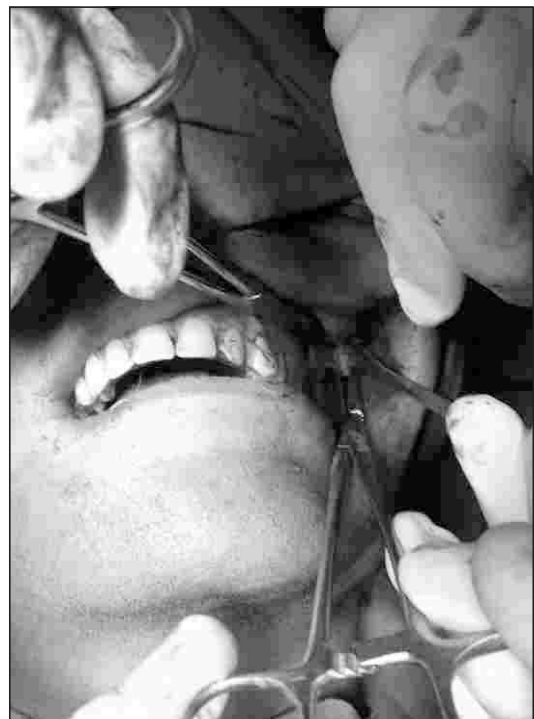


Fig. 4 (b) Intraoperative Coronoidtomy

Discussion: Oral Submucous Fibrosis is a chronic, crippling condition of the mouth resulting in significant health and social problems, which may interfere with the regular inspection of the oral cavity for cancer, adequate nutritional intake, dental hygiene and speech.¹³

The important histopathological characteristic of oral submucous fibrosis is the deposition of collagen in the oral submucosa.¹⁴ The areca nut (betel nut) component of betel quid, especially an alkaloid called arecoline, plays a major role in the pathogenesis of oral submucous fibrosis by causing an abnormal increase in the collagen production.¹⁵

areca nut, supporting an association between the areca nut use and the disease. In the present study, about all the 4 patients had gutkha chewing habit and betel nut chewing with areca nut...

In the present study, duration of tobacco product abuse ranged from 5 -10 years. It was seen that most patients present with a complain of an irritable oral mucosa during the early stage of the disease, especially when spicy foods are eaten. Clinically, there are erosions and ulcerations. Subsequently, the oral mucosa becomes blanched and loses its elasticity, and vertical bands occur in the buccal mucosa, the retromolar area, the soft palate, and the pterygomandibular raphe.

In the present study, out of 4 patients only 1 patient presented with burning sensation upon eating spicy food, occasional ulcers and all patients had white marbled appearance of the buccal mucosa, vertical fibrous bands in the buccal mucosa and circular bands in the lips. However, clinical assessment of the hard & soft palate, faucial pillars, uvula, tongue movements and floor of mouth was not possible due to restricted mouth opening of 7mm in patient which was operated with fibrectomy with collagen membrane, 20mm mouth opening in patient done with Laser, 17mm mouth opening in patient done with Fibrectomy with buccal fat pad placement, and 7mm mouth opening in patient done with coronoideotomy. In the present study, the minimum inter-incisal opening was 7 mm. Whereas, maximum inter-incisal opening was 20 mm.

Oral submucous fibrosis treatment is based on the severity of the disease.¹⁶

Khanna and Andrade¹⁶ gave a classification system for oral submucous fibrosis based on mean interincisal opening (IIO): stage I, early oral submucous fibrosis without trismus (IIO >35 mm); stage II, mild to moderate disease (IIO 26–35 mm); stage III, moderate to severe disease (IIO 15–25 mm); stage IVa, severe disease (IIO <15 mm); and stage IVb, extremely severe–malignant /pre-malignant lesions noted intraorally.

In their study, considering the severity of the trismus and the histopathological findings of secondary muscle degeneration and fibrosis in stages III and IV, suggested surgical treatment was the only solution, and that bilateral temporalis myotomy and coronoideotomy were highly effective surgical procedure.

Following the same protocol, in the present study, all 4 patients with stage III oral submucous fibrosis and stage IVa oral submucous fibrosis were planned to be treated surgically to relieve trismus.

Various surgical approaches have been tried, with varying results, including: simple division of the fibrotic bands; use of Collagen membrane and Buccal Fat Pad to cover the musculomucosal defect. Simple excision of the fibrous bands with Laser and propping the mouth open to allow secondary epithelialization causes rebound fibrosis and disability during healing. Relapse and failure to perform mouth-opening exercises were due to pain intolerance¹⁷ caused by the stretching action of degenerated strong mouth opening muscles.

Masticatory muscle myotomy and coronoideotomy release the stretching action of strong degenerated muscles and aiding aggressive postoperative mouth opening exercises, which are the most important factor in maintaining intraoperative IIO in the long term.¹⁸

Over the years many authors have mentioned coronoideotomy as an adjuvant therapy in increasing inter-incisal opening intra-operatively and maintain it post-operatively. But, in the recent years bilateral coronoideotomy has been advocated as an integral part of the surgical treatment of oral submucous fibrosis.

The advantages of using coronoideotomy are: there are no adverse effects in removing the bilateral coronoids, no morbidities simple and easy

procedure to perform, achieving better intra-operative inter-incisal opening, no problems associated with post-operative healing and better patient compliance to physiotherapy.

In the present study, 2 cases were surgically managed with fibrectomy and suitable graft material was used to cover the buccal defect, 1 case was treated with Laser while in the other one case along with the steps used for fibrectomy additional steps of bilateral temporal myotomy and coronoideotomy were performed. The mean intra-operative inter-incisal opening achieved in the 3 cases done with fibrectomy was around 40mm while in case done with coronoideotomy was around 43 mm suggesting that coronoideotomy helped achieving greater intra-operative, inter-incisal opening as compared to when only fibrectomy was performed. This study also showed, that in post-operative follow-up period, the inter-incisal opening was maintained higher in the case with coronoideotomy over the period of one year.

Various inter-positional grafting material are used to cover the raw area after excision of the fibrous bands for guided tissue healing and prevention of wound contracture. The use of collagen are popular due to the ready availability and the decreased incidence of morbidity

In the present study, all the patients were explained about the importance of covering the buccal defect after fibrotomy and the graft materials were used according to patient's consent. The most commonly used graft material was collagen membrane. Buccal fat pad was used in 1 of patients with good results.

Various devices and techniques used for physical therapy in oral submucous fibrosis are:

ice-cream sticks, hot water gargling, ballooning of mouth, acrylic screws, rubber mouth props, Heister's jaw opener, localized heat such as with microwave diathermy or ultra sound. The aggressive physiotherapy improves the local circulation which minimizes the propensity of fibrosis.

All the patients in the present study underwent aggressive mouth-opening exercises with the help of Heister's jaw opener from the third post-operative day and were counselled to continue mouth-opening exercise at home with Heister's jaw opener 4-6 with frequent 15 minutes per session.

In the present study, it was observed that patient compliance was better in where bilateral temporalis myotomy and coronoideotomy was used in adjunct to bilateral fibrotomy and suitable graft material.

This study showed, that coronoideotomy helped achieve significant difference in intra-operative inter-incisal opening as well as maintenance in the follow up period.

Conclusion: With the evaluation of the cases of oral submucous fibrosis presented in this article, we concluded that surgical treatment like fibrectomy followed by graft material is a one of the treatment used to prevent the recurrence of the condition. But if the condition is severe and long term advanced procedure like coronoideotomy gives better results. Various mouth opening exercises, cessation of habits and improvement in nutritional status is a must for better results post-operatively.

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