

Various treatment modalities in the treatment of Oral submucous fibrosis

¹Dr. Karan Punn, Reader, Department of Oral & Maxillofacial Surgery, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow

²Dr. R.S.Bedi, Professor, Department of Oral & Maxillofacial Surgery, Saraswati Dental College, Lucknow

³Dr. Ajita Meenawat, Reader, Department of Periodontology, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow

⁴Dr. Gaurav Singh, Professor, Department of Oral & Maxillofacial Surgery, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow

⁵Dr. Vivek Srivastava, Reader, Department of Periodontology, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow

⁶Dr. Abhinav Srivastava, Lecturer, Department of Oral & Maxillofacial Surgery, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow

Corresponding Author: Dr. Karan Punn, Reader, Department of Oral & Maxillofacial Surgery, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Lucknow

Citation of this Article: Dr. Karan Punn, Dr. R.S.Bedi, Dr. Ajita Meenawat, Dr. Gaurav Singh, Dr. Vivek Srivastava, Dr. Abhinav Srivastava, “ Various treatment modalities in the treatment of Oral submucous fibrosis ”, IJDSIR- July - 2020, Vol. – 3, Issue -4, P. No. 108 -115.

Copyright: © 2020, Dr. Karan Punn, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Introduction

Oral sub mucous fibrosis (OSMF) is an insidious, chronic disease affecting any part of the oral cavity and sometimes the pharynx. Although occasionally preceded by and/or associated with vesicle formation, it is always associated with a juxtra-epithelial inflammatory reaction followed by a fibroelastic change of the lamina propria, with epithelial atrophy leading to stiffness of the oral mucosa causing trismus and inability to eat.¹

The disease predominantly affects the South and South East Asian population especially those in the Indian

subcontinent. Oral sub mucous fibrosis has now become an Indian epidemic with an estimated 2.5 million people being affected with this disease.²

Alongside the role of local irritants such as capsaicin, tobacco, areca nut, pungent and spicy foods and alcohol, underlying systemic predisposition is likely because of the geographical and ethnic distribution of OSMF. Some of the key systemic factors are chronic iron and vitamin B-complex deficiency, anaemia and a genetic predisposition to the disease.³

While burning sensation experienced on eating spicy food or on intake of hot beverages is the most common initial symptom, other early symptoms may include blisters, ulcerations, or recurrent stomatitis. Patient is generally unaware of the serious precancerous nature of the disease. It is only late in the disease process that the patient develops disability due to decreased mouth opening. Therefore the point of time in the disease process during when patient seeks dental care is late.

Over the years many treatment modalities have been used in the management of OSMF. The non-surgical modalities that have been used are gold, arsenic trioxide, large dosage of iodine, liver extracts⁴, placental extracts, hyaluronidase, dexamethasone.⁵ Significantly better results have been obtained by giving local injections of chymotrypsin, hyaluronidase and dexamethasone together. Combined therapy with nyldrinhydrochloride (a peripheral vasodilators), Vitamin D, E and B complex, iodine, placental extract, local and systemic corticosteroids, and physiotherapy claims a success rate of 62% in OSMF cases.⁶ Recent researches have also shown promising results with locally injectable hyaluronidase and dexamethasone and systemically administered antioxidants.

Surgical modalities comprise bilateral resection of fibrous bands with or without coronoidectomy along with coverage of raw area with nasolabial flaps, split skin grafts, transposition of the buccal pad of fat, dorsal tongue flap, radial forearm flaps, flaps of the temporalis fascia/muscle or both, palatal island flaps and mucosal grafts, placental grafts have been used. However none of the modalities have given 100% results.⁷

In the present study clinical effects of non-surgical treatment using antioxidant-vitamin-topical steroid combination, Placentex-Hyaluronidase-Steroid injection combination along with active physiotherapy were

assessed. These were also compared with surgical interventions i.e. transposition of the buccal pad of fat (as a graft to cover the surgical wound) and the use of the collagen sheet as a wound dressing material.

Material & Methods

A randomized case controlled clinical study was performed on 28 patients aged between 18-60 years, suffering from oral sub mucous fibrosis. The study confined to the ethical guidelines of the Helsinki Declaration and was evaluated and approved by the Institutional Ethical Committee. A written informed consent was obtained from all subjects participating in the study. The selection criteria were based upon the following criteriae wherein the patients with decreased mouth opening (maximum mouth opening ranging from 5mm to 20mm), blanched mucosa (soft palate, buccal, labial and retromolar area), palpable fibrous bands in buccal mucosa, reduced mucosal suppleness, burning sensation, who were physically healthy and well oriented in time, space and person, who presented positive history of chewing areca nut or one of its commercial preparation, who agreed to take medication and follow up for 90 days and were not on any treatment for the same were included in the study. The exclusion criteria were patients suffering from chronic debilitating diseases (diabetes mellitus, pulmonary tuberculosis, bleeding disorders etc.), with findings of any physical or mental abnormality that would interfere with or be affected by the study procedure, with known allergy or contraindication to study medication. Irrespective of the modality, all patients were counselled to quit the deleterious habits. The study groups were broadly classified as:

Group A: Medicine Line of Treatment [Table 1]

The patients undergoing medical line of treatment were further divided into 2 groups randomly without any selection bias

Group A1: This included combination of drugs of antioxidant, vitamin and topical application of steroid followed by active physiotherapy

Group A2: This included intra-lesional injection therapy with combination of Placentrax, Hyaluronidase, and Steroid under local anaesthesia followed by active physiotherapy

Table 1: Sample Distribution of Group A

S.N.	Group	No. Patients	Age Range
1	Combination of medicines (Group A1)	07	18-60
2	Intralesional injection therapy (Group A2)	07	18-60

Group B: Surgical Line of Treatment [Table 2]

The patients undergoing surgical line of treatment were further divided into 2 groups randomly without any selection bias.

Group B1: Fibrous bands in the buccal mucosa were sectioned followed by harvesting and transposition of buccal fat pad into the mucosal defect (Tideman et al. 1986)⁸

Group B2: Sectioning of fibrous bands and covering the mucosal defect with collagen sheet (Paramhans et al. 2010)⁹

Table 2: Sample Distribution of Group B

S.N.	Group	No. Patients	Age Range
1	Buccal Pad of Fat (Group B1)	07	18-35
2	Collagen sheet (Group B2)	07	18-35

Procedure

A thorough clinical examination was carried after detailed patient’s personal history including different chewing habits (such as pan, tobacco, gutka chewing), the duration and frequency of chewing.

Symptoms like burning sensation to normal food or spicy food, mucosal change, restricted mouth opening, tongue restriction, presences of fibrous bands were noted.

Extra orally clinical signs like inter-incisal mouth opening were measured using scale from mesio-incisal angle of upper central incisor to mesio-incisal angle of lower central incisor in millimetres pre-treatment, 1st week, 4th week, 8th week, and 12th week post treatment.

Intraorally, different sites were examined for blanching, consistency, and fibrous bands in the buccal mucosa. The patients underwent detailed haematological and clinical test to rule out systemic ailments of hypertension, diabetes mellitus, bleeding diathesis etc.

Group A1

Following the grading given by (Pindborg, 1980)¹⁰ group I comprised patients having Grade I and Grade II OSF incipient and mild. Patients enrolled in this group were given medicinal treatment in the form of multivitamins, antioxidants and topical application of steroids which included Capsule Aquasol (Vitamin A, 25000 IU), Capsule Lycofirst (Lycopene, 5000mcg), Tablet Supradyne (Vitamin D3, 10,000 IU, Thiamine 10 mg, Riboflavin 10mg), Capsule Zevit (B complex + Vitamin C+ Zinc Sulphate). All these combination of medicines were given once daily for 90 days along with topical application of Ointment Cinort having more orabase(0.1%triamcinolone acetionide) three times daily for 90 days with vigorous oral physiotherapy with either Hiester’s mouthgag or wooden spatula.

Group A2

This group of patients comprised having Grade II severe and Grade III OSMF with moderate stage. These patients were chosen for intra-lesional injection comprised of 1 vial of dexamethasone, 1 vial of placentrax and 1 vial of hyalunoronic acid biweekly for 8 weeks and once a week from 8th to 12th week with vigorous oral physiotherapy with either Hiester’s mouthgag or wooden spatula.

In all the patients with IIO in the range of 05mm to 20 mm, conventional fibrotomy with coronoideotomy was done after thorough clinical and preanaesthetic evaluation.

Group B1

In the patients of this group, the buccal fat pad was exposed. It was moved anteriorly with care being taken not to tear it, to cover the entire mucosal defect and was anchored to the entire length of the mucosal defect using 3.0 vicryl sutures, superiorly and inferiorly.

Group B2

In this group, after blunt dissection of the fibrous band, a dry collagen sheet was placed over mucosal defect and secured in place as surgical dressing with 3.0 vicryl interrupted sutures and pressure or overdressing of betadine soaked gauze was given with stay sutures.

A mouth prop was placed intra orally to maintain the inter-incisal distance. Inter-incisal distance was measured daily for first seven days and active oral physiotherapy was advised. Mouth opening exercise using Hiester’s gag and wooden spatula were taught to patient and IIO was maintained over 35mm for 7 days in all cases.

Success of the graft was determined after 7 days in all cases by reassessment of vascularity, adaptability to underlying surface and appropriate coverage of the raw surface following excision of bands. In Group II patients, collagen sheet was removed on the 7th postoperative day and in three cases on the 10th postoperative day.

Statistical Analysis

Data were summarized as Mean ± SD. The basic characteristics of four groups were compared by one way analysis of variance (ANOVA) and the significance of mean difference between the groups was done by Newman-Keuls post hoc test. The discrete (categorical) observations of four were compared by chi-square (χ^2) test.

Results

There were total 28 male subjects stratified equally into four subgroups according to their OSF grade to treat with non-surgical mode of treatments A1 (Medicinal treatment) and A2 (Intralesional injection therapy) and surgical mode of treatments B1 (Buccal pad of Fat) and B2 (Collagen sheet).

Comparing the symptoms between the groups, χ^2 test revealed similar ($p>0.05$) proportion of symptoms among the groups ($\chi^2=16.83$; $p=0.051$). [Table III]

Table 3

Symptoms	A1 (n=7)	A2 (n=7)	B1 (n=7)	B2 (n=7)	χ^2 value (DF=9)	p value
S1	6 (85.7%)	1 (14.3%)	1 (14.3%)	1 (14.3%)	16.83	0.051
S1, S2	1 (14.3%)	4 (57.1%)	5 (71.4%)	6 (85.7%)		
S1, S3	0 (0.0%)	1 (14.3%)	1 (14.3%)	0 (0.0%)		
S1, S2, S3	0 (0.0%)	1 (14.3%)	0 (0.0%)	0 (0.0%)		

Mucosal Change

In group A1 and A2, the mucosal change frequency C2 was higher than the C3 while in B1 and B2 groups the frequency of C3 was higher than the C2 ($p>0.05$). [Figure 1].

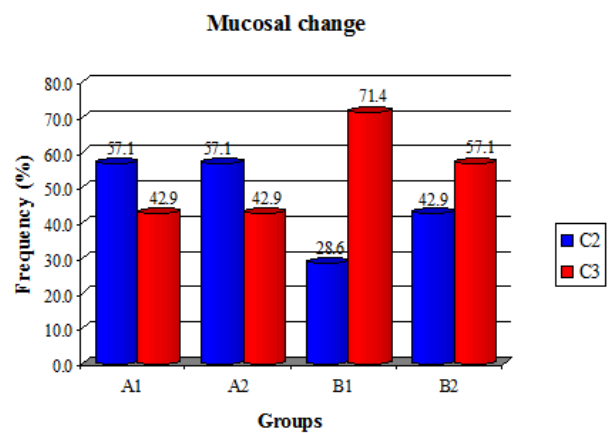


Figure 1: Frequency distribution of mucosal change of four groups

Tongue Restriction

In group A1 and A2, the tongue restriction frequency T1 and T2 was higher than the T3 while in B1 and B2 groups the frequency of T2 and T3 was higher than the T1.[Figure 2].

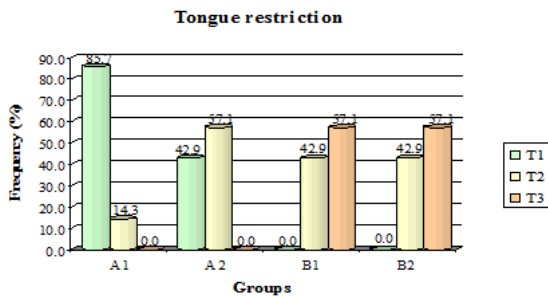


Figure 2: Frequency distribution of tongue restriction of four groups

Fibrosis

In group A1 and A2, the fibrosis frequency F2 and F3 was higher than the F4 while in B1 and B2 groups the frequency of F3 and T4 was higher than the F2. Comparing the fibrosis between the groups, similar ($p>0.05$) proportion of fibrosis among the groups was observed.

In Group A1 subjects were mostly with OSF grade I and II. In group A2 all were with OSF grade III. In group B1 and B2 all were with OSF grade IV. Comparing the OSF grades between the groups, χ^2 test revealed significantly ($p<0.001$) different proportion of OSF grades among the groups ($p<0.001$). [Figure 3].

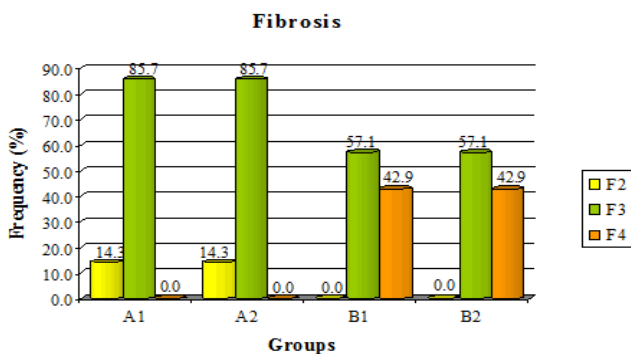


Figure 3: Frequency distribution of fibrosis of four groups

Pre and Post Treatment Mouth Opening

The pre and post treatments mouth opening in all four groups increased after the treatments and at final evaluation the improvement (from baseline to 3 month) was seen. It was highest in B1 (73.8%), followed by B2 (68.6%), A2 (43.1%) and A1 (20.6%) showed the least. [Table 4 & Figure 4]

Table 4: Pre and post treatments summary (Mean \pm SE, n=7) of mouth opening of four groups over the periods

Groups	At baseline	After 1 months	After 2 months	After 3 months	Mean change	% mean change (baseline-3 months)
A1	34.71 \pm 1.54 (28-41)	37.00 \pm 1.21 (33-43)	40.71 \pm 0.84 (38-45)	43.71 \pm 0.52 (41-45)	9.00 \pm 1.29 (4-15)	20.6%
A2	24.29 \pm 0.71 (22-28)	33.71 \pm 0.84 (31-37)	41.43 \pm 0.72 (38-43)	42.71 \pm 0.29 (41-43)	18.43 \pm 0.69 (15-21)	43.1%
B1	11.57 \pm 1.31 (5-16)	41.00 \pm 0.38 (40-42)	42.14 \pm 0.26 (41-43)	44.14 \pm 0.40 (43-46)	32.57 \pm 1.51 (27-40)	73.8%
B2	12.86 \pm 1.14 (7-16)	40.29 \pm 0.29 (39-41)	40.57 \pm 0.20 (40-41)	41.00 \pm 0.38 (40-43)	28.14 \pm 1.12 (25-33)	68.6%

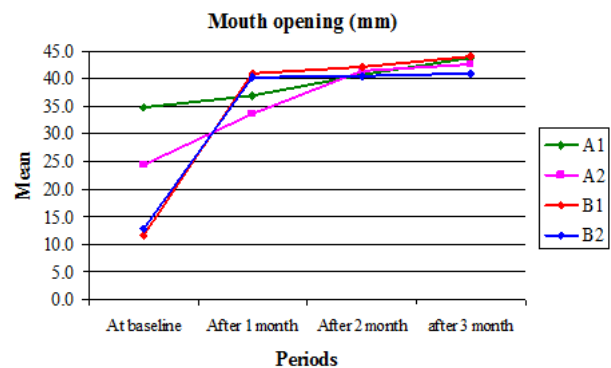


Figure 4 : Pre and post treatments mouth opening

However, the mouth opening at 2 month post-treatment and at 3 month post-treatment did not differ between the groups i.e. found to be statistically the same. In other words, all treatments induced maximum and significant

improvement in mouth opening just after 1 month of treatment, thereafter; it remains constant up to 3 month or did not improved significantly, especially in B1 and B2.

However, comparing the net improvement in mouth opening (at 3 month - at baseline) of four groups the improvement in mouth opening of group A2, B1 and B2 was found to significantly different and higher as compared to A1. Further the improvement in mouth opening of group B1 and B2 was also found to be significantly different and higher as compared to A2. The improvement in mouth opening of group B1 was also found to be significantly different and higher as compared to B2.

Discussion

Oral Sub Mucous Fibrosis is a precancerous condition characterised by burning sensation of mucosa, mucosal blanching, which may be spotty, resulting in marbled appearance and stiffness of oral mucosa, formation of vesicles/ulcers, stomatitis, sensation of dry mouth, alteration in taste. Fibrosis of oral mucosa occurs followed by stiffness most commonly in the buccal mucosa, soft palate and faucial pillars. Fibrotic bands running vertically in the cheek and circumferentially in the lips are palpable. Limited function of the soft palate, shrunken and bud like uvula, restricted tongue movements are other effects.

The treatment of patients with OSMF depends on the degree of clinical involvement. Medicinal modalities of treatment like topical application of gold, iodides and intra-lesional injection of hyaluronidase, hydrocortisone, placental extract and triamcinolone along with oral administration of vitamins, iron supplements and antioxidants offer temporary benefit and show limited use in treating moderately advanced and advanced cases of OSMF.

Intralesional steroids have an anti-inflammatory effect, hence if administered weekly may prevent further damage.

These dissolve fibrotic bands thereby relieving burning sensation. Placental extracts stimulate pituitary adrenal cortex regulating metabolism of the tissue. It has anti-inflammatory effect and aids wound healing. Hyaluronidase improves health of the mucous membrane and helps in relieving burning sensation and trismus. It also lowers the viscosity of intercellular cementing substance.

In present study medicinal and surgical line of treatment for various grades of oral sub mucous fibrosis were compared. Medicinal treatment included antioxidant, vitamin therapy with topical application of steroids, and intralesional therapy of placentex, hyaluronidase and steroid.

Surgical treatment is considered to be the only solution in Group IV and Group V cases. Materials used for grafting in the OSMF cases after excision of fibrotic bands include skin grafts, tongue flaps, buccal fat pad, amnion graft, nasolabial flaps, palatal island flaps etc. Additional procedures like temporalis myotomy and bilateral coronoidectomy can be performed to enhance mouth opening. Mere cutting of the fibrotic bands followed by forcible mouth opening and allowing secondary epithelialisation leaves an unsatisfactory rigid buccal mucosa surface even when attempts are made to reduce collagen formation by insertion of steroid impregnated packs.

The present study involved bilateral resection of buccal fibrotic bands followed by either of two dressing material or grafts such as transposition of buccal pad of fat for wound coverage as graft and collagen sheet (dry) as a wound dressing material.

These procedures are relatively convenient and carry less post-operative morbidity. *Tidemann et al.*⁸ proposed that because the buccal pad of fat has been rotated onto the defect it is not necessary to sever the pedicle, and also

that this pedicle graft provides a bed of tissue for subsequent epithelialisation.

The success of treatment was measured in terms of mouth opening in millimetres (mm) at various time intervals post operatively as well as at the end of follow up i.e. 90 days. Mouth opening was the only parameter which could be quantified

It is with above consideration that subjective parameters like pain, swelling, colour of mucosa, palpability of fibrous bands and suppleness of the mucosa were included in this study. These parameters coupled with post-operative mouth opening constituted the efficacy of one method over the other.

Swelling in patients of group B2 resolved by 14th day and by 28th day in group B1. This can be attributed to the fact that the use of buccal pad of fat entails more morbidity at the surgical site since the transposition of the buccal pad of fat requires deeper dissection and the pad must be mobilised adequately to cover the defect.

By 28th day the colour of mucosa in patients of group B2 had an opaque mucosa. At the end of the follow up period, however 5 patients had a normal pale pink mucosa and 2 patients had a pale mucosa in group B2. In group B1, by day 28th all patients had an opaque mucosa except 1 patient mucosa had returned to normal pink. At the end of the follow up period in group B1, 5 patients mucosa had returned to normal pink but 2 patients still had pale mucosa. These results indicate that the colour of mucosa changes to normal since this return is dependent on epithelialisation. Also the faster colour of the return of normal colour of mucosa in group B1 can be explained by the fact the wound was covered by autologous graft in contrast to collagen sheet in group B2.

Among the oral symptoms, group A1 and A2 mostly had symptoms S1 (burning sensation), S2 (dryness of mouth) while B1 and B2 had S1, S2, S3 (ulcerations).

In group A1 and A2, the mucosal change frequency C2 (loss of elasticity) was higher than the C3 (leather like mucosa) while in B1 and B2 groups, mucosal change frequency C3 was higher. No statistically significant difference could be found comparing the mucosal changes between the four groups, owing to different grades of OSF in groups A and B. Therefore mucosal change may not influence the study outcome measures (opening of mouth). In Group A1 subjects were mostly with OSF grade I and II. In group A2 all were with OSF grade III. In group B1 and B2 all were with OSF grade IV. Since OSMF grade of the four groups were not matched it had a statistically significant influence on the study outcome measures (opening of mouth). As the clinical grading of the disease increases the improvement with the non-surgical modalities is restricted.

The above observation could be attributed to the fact that as the disease progresses, the density of the fibrous deposits increases causing fixation, shortening and deviation of the uvula and soft palate. Fibrosis of the faucial pillars and pterygomandibular raphe and the piriform fossa cause impairment of the tongue movements. With progressing fibrosis stiffening of certain areas of the mucosa occurs leading to difficulty in opening the mouth. Clinical symptoms like burning mouth sensation, trismus and restricted mouth movements significantly affect the quality of life of the patients. None of the interventions reported so far have recorded an absolute improvement in oral symptoms and quality of life in oral sub mucous fibrosis patients. However, it is imperative that clinical grading and necessary treatment warranted for the case be performed for relief from symptoms and improvement in the quality of life. The pre-treatment mouth opening is significantly associated to Tongue restriction and OSF grade.

Surgical treatments (Buccal pad of Fat and Collagen sheet) are significantly better than non-surgical treatments (Medicinal treatments and Intralesional injection therapy).

- Among the medical line of treatments, Intralesional injection therapy is significantly better than medicines (capsules and tablets).

- Buccal pad of Fat is significantly better than Collagen sheet.

The study concludes that, for the management of OSMF, all modalities are effective but among them surgical modality is found to be most effective and reliable treatment.

References

1. Pindborg JJ, Sirsat SM. Oral Submucous Fibrosis. Oral Surg, Oral Med, Oral Pathol 1966; 22(6): 764-779.
2. Cox SC, Walker DM. OSMF-A review. Aust Dent J 1996; 41(5): 294-299.
3. Rajendran R, DM Vasudevan, Vijayakumar T. An alternative pathogenetic pathway for oral submucous fibrosis. Med Hypotheses 1989; 30:35-37 (Abstract-Pubmed) Available from <http://www.ncbi.nlm.nih.gov>.
4. Chaturvedi VN, Sharma AK, Marathe NG. Intraoral injection of hydrocortisone and hyaluronidase in oral submucous fibrosis. Indian Prac 1990; 575-580.
5. Gupta D, Sharma SC. Oral submucous fibrosis: anew treatment regimen. J Oral Max. Fac. Surg. 1990;46:830-833
6. Sharma JK et al. Clinical experience with the use of peripheral vasodialator in oral disorders.Int.J. Oral Ma. Fac. Surg. 1987;16:695-699.
7. Rajendran R. Oral submucous fibrosis: etiology, pathogenesis and future research. Bull World Health Organ 1994; 72:985-986.
8. Tideman H, Bosanquet A, Scott J. Use of the buccal fat pad as pedicled graft. J Oral Maxillofac Surg 1986; 44:435.
9. Paramhans D, Mathur RK, Newaskar V, Shula S. Role of collagen membrane for reconstruction of buccal defects following fibrotic band excision and coronoidectomy in OSF. M P Society of Otolaryngologists, Waent 2010.
10. Pindborg JJ et al. Incidence and early forms of oral submucous fibrosis.Oral surg. oral med. Oral Pathol., 1980, 50: 40-44.