

Effect of Intralesional Injection of Triamcinolone Acetonide in Oral Sub-Mucous Fibrosis

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ABSTRACT

Objective To assess the effectiveness in terms of improvement in mouth opening after intralesional injection of triamcinolone acetonide in oral sub-mucous fibrosis (OSMF).

Study design Cross sectional study.

Place & Duration of study Department of Plastic Surgery Dow University of Health Sciences & Dr. Ruth KM Pfau Civil Hospital Karachi, and Oral and Maxillofacial Surgery Department Abbasi Shaheed Hospital Karachi, from May 2017 to April 2018.

Methodology This study included patients of either gender with the history of chewing of areca nut and clinically diagnosed as having OSMF (mouth opening between 10 -25mm). Patients with trismus due to temporo-mandibular joint (TMJ) problems, and previously treated OSMF were excluded. Triamcinolone acetonide 40mg at weekly interval for consecutive six weeks were given intralesionally and patients were followed for six months. Outcome in terms of improvement in mouth opening (i.e. inter-incisal distance in millimeters) was measured using vernier caliper. Data was analyzed by using SPSS version 20.

Results This study included 60 patients with the age between 20 to 45 years. There was marked improvement in mouth opening. In paired comparison statistically significant difference $t = -31.157$, $P < 0.001$ with mean 9.367 ± 2.329 , 95% Confidence Interval of the difference lower-9.968 upper-8.765 was observed.

Conclusion Intralesional injections of triamcinolone acetonide resulted in significant improvement in patients with OSMF in terms of mouth opening.

Key words Intralesional injection, Oral submucous fibrosis, Triamcinolone acetonide.

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INTRODUCTION:

Oral submucous fibrosis was reported in 1952 by Schwartz as atrophica idiopathica mucosae oris.¹ Pindborg et al defined oral submucous fibrosis as an insidious chronic fibrotic disease involving the oral mucosa.² OSMF shows epithelial atrophy, fibroelastic changes in the submucosa and trismus due to stiffness of the oral mucosa. It mainly affects the population of Southeast Asia.³ The prevalence of OSMF in our population as reported in previous studies is 4.1%.⁴ Rana et al in a study also found OSMF to be the most common pre-cancerous condition.⁴ The main agent which has a pivotal role in the development of OSMF is areca nut.^{5,6} Previously many studies showed female predominance, but according to new research OSMF has a very strong

male predilection of 3:1.²

Multiple management protocols are available for OSMF to alleviate the pain, burning sensation and improve mouth opening.⁷ Treatment options for OSMF include drug therapy with agents that have antifibrotic, anti-inflammatory and antioxidant activity like multivitamins including lycopene, spirulina, pentoxifylline, and iron supplements. Intralesional injections of steroids, physiotherapy and fibrotomy are also used.^{5,8} Triamcinolone acetonide is a known corticosteroid hormone (glucocorticoid). It acts as an immune suppressive agent. It prevents fibrosis by a decreasing fibroblastic proliferation and deposition of collagen due to anti-inflammatory action.⁹ It is one of the least invasive and cost effective treatment modalities, which is easily available. In this study we analyzed the effect of intralesional injections of triamcinolone acetonide as a therapeutic agent in oral submucous fibrosis.

METHODOLOGY:

This was a cross sectional study conducted in the Department of Plastic & Reconstructive Surgery, Dow University of Health Sciences & Dr. Ruth KM Pfau Civil Hospital Karachi and Oral and Maxillofacial Surgery Department Abbasi Shaheed Hospital Karachi, from May 2017 to April 2018. The sample size estimation by OpenEpi sample size calculator yielded a sample size of 60 patients with prevalence of 4.1%⁴, 95% confidence interval and 90% power. Non-probability consecutive sampling technique was used for inducing patients.

Patients were labelled as having oral submucous fibrosis on the basis of clinical parameters like blanching, mucosal hardness, palpable intraoral fibrotic bands and limited mouth opening. Patients of both genders with age between 20 to 45 years, with habit of chewing areca nut were included. Patients of submucous fibrosis of Group III which is described as moderately advanced condition with the mouth opening 15-25mm, and Group IVa which are advanced case with mouth opening 2-15mm were included. Patients who underwent any oral surgery or any drug therapy for this condition and patients with reduced mouth opening because of conditions like pericoronitis, due to impacted mandibular third molars, temporomandibular joint problems, previously treated for the OSMF and allergic conditions were excluded. Patients of Group I, Group II, and Group IVb, premalignant and malignant transformation cases were also excluded. An informed consent was obtained from all participants.

Patients were divided into three categories according

to the pre-interventional mouth opening. Class I: 10-15mm mouth opening, Class II: 16-19mm mouth opening and Class III: 20-25mm mouth opening. Fibrous bands were palpated at the various sites of the buccal mucosa. Injection was prepared by mixing 1 ml of triamcinolone acetonide 40 mg/ml and 0.5 ml of xylocaine with 2% adrenaline (1:200,000). A total of 1.5 ml of solution was injected in submucosa on both sides using 26 gauge needles, at weekly interval for six weeks. The outcome of this treatment regimen was checked by measuring improvement in mouth opening in millimeters (i.e. maximal inter-incisal distance) with the help of vernier caliper. Three groups; Group I: < 5mm, Group II: 5 to 10mm and Group III: >10 mm were made according to the increase in mouth opening. Patients were followed up to six months in outpatient department.

Information regarding the duration of betel nut chewing, age and gender was collected. Data was recorded on a pre-designed structured form. Data was analyzed by using SPSS version 20. Descriptive statistics were used to calculate mean scores, standard deviation and 95% Confidence Interval. The mouth opening at pre and post interventional stages was compared using paired 't' test. A p value of <0.05 was considered significant.

RESULTS:

A total of 60 patients were enrolled. There 52 male and 8 female patients with male to female ratio of 6.5:1. Most of the patients belonged to the 30 year -35 year age group. Fifty-three (88.3%) patients had the habit of chewing areca nut for less than 10 years and in others more than that. At the pre interventional stage Class I patients were 6 (10%), Class II 43 (71.7%) and 11 (18.3%) Class III. During the analysis of increment in the mouth opening it was recorded that there was only 1 (1.7%) patient in Group I, 38 (63.3%) in Group II and III. This is given in table I.

The result of comparison between duration of chewing habit with improvement of mouth opening showed that post interventional mouth opening was remarkably greater in patients with less than 10 years of chewing habit. Degree of improvement in mouth opening in relation to gender was not significant. Patients with injection treatment showed statistically significant difference in mouth opening ($t = -31.157$, $Df = 59$, $P < 0.001$) over a period of 6 months (table II).

Table I: Relationship Between Improvement of The Mouth Opening and Gender

		Improvement in Mouth opening (MO)			Total	P value
Gender	Female	< 5mm	5 to 10 mm	> 10 mm	8 (13.3%)	0.605
		0	4 (6.7%)	4 (6.7%)		
Male	1 (1.7%)	34 (56.7%)	17 (28.3%)	52 (86.67%)		
Total	1 (1.7%)	38 (63.3%)	21 (35%)	60 (100%)		

Table II: Comparison of Mouth Opening: Pre and Post Intervention

	Mean	Std. Deviation	Paired Differences			t	Df	P value
			Std. Error Mean	95% Confidence Interval of the Difference				
Mouth opening postoperatively after 6 months	-9.367	2.329	0.301	-9.968	-8.765	-8.765	59	0.000 (p = <0.001)

DISCUSSION:

Oral submucous fibrosis is a potentially malignant disease characterized by progressive fibrosis of the oral soft tissues, with a high rate of occurrence in the population of Southeast Asia but has been recognized nowadays also in Europe and North America.^{2,3} It is a disabling and debilitating disease involving oral mucosa, and sometimes progresses further in the upper aerodigestive tract.^{10,11} The striking features of OSMF are decreased tissue flexibility, hardness and restricted mouth opening as the disease progresses, which compromise ability to masticate and phonation of words.¹⁰⁻¹² The sites involved most commonly in decreasing order of frequency are buccal mucosa, palate, retromolar region, faucial pillars and pharynx.¹¹

In our study male preponderance was seen as reported in previous studies.¹³ Maximum number of patients in our study were adults. A study by Maher et al showed similar results, in which 70% were below 30 years of age.¹⁴ All the patients had a habit of areca nut (betel nut) chewing. OSMF is a multifactorial disease. The precise etiology of OSMF is still unknown.^{15,16} There is excessive secretion of collagen and increased proliferation of fibroblasts along with suppression of collagenase and fibrinolytic system, resulting in increase in collagen deposit in the submucosal tissue involving blood vessels, salivary glands, and muscle producing hypovascularity and fibrosis which is visible as blanching causing marble like appearance, fibrotic intraoral bands and limited mouth opening.^{3,17}

Various treatment modalities have been proposed for OSMF but with unpredictable results. On a broader scale two basic approaches are known for the management of OSMF, surgical and conservative treatment.⁵ Surgical methods are reserved for severe trismus. It involves fibrotomy to release the fibrotic areas, but it leads to further scarring and fibrosis.¹⁸ In areas of band excision, different flaps have been used as interpositional tissue like buccal fat pad, tongue flaps, palatal island flaps, nasolabial flap, temporalis fascia flap or free tissue transfer, but with variable results.^{18,19} Conservative treatment includes physiotherapy and medical management. The basic aim of physiotherapy is to induce tissue remodeling to enhance movement with the help of stretching exercises, splints to increase mouth opening, or heat application.⁵ Medical treatment comprises of dietary modification with addition of iron and vitamin supplements like lycopene alongwith some antioxidants like spirulina.²⁰ Other medicines that are given either orally or through submucosal injection include anti-inflammatory drugs (corticosteroids, pentoxifylline), enzyme for proteolysis (hyaluronidase), immunoregulatory molecules (interleukin-1 receptor antagonist) and aqueous extract of healthy human placenta.^{5,20} In this study steroid was used.

Steroids are immunosuppressive agents and also have anti-inflammatory properties.⁸ They decrease the proliferation of fibroblasts as well as collagen deposition, and thereby prevent fibrosis.²¹ A study reported marked increase in mouth opening following

intralesional triamcinolone therapy.²² Triamcinolone acetonide is preferred due to its high potency, duration of action, and decreased systemic absorption.^{23,24} In our study all patients were advised to stop areca nut chewing. With triamcinolone acetonide interincisal mouth opening was increased which was highly significant.

CONCLUSIONS:

Intralesional injections of triamcinolone acetonide showed promising results in terms of increased mouth opening. It was found to be the preferred treatment of OSMF.

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