

Effect of Coronoideotomy as an Adjuvant Procedure on Postoperative Mouth Opening in Oral Submucous Fibrosis Patients.

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Abstract

AIM A total of 30 patients between the ages of twenty to fifty years, regardless of gender, with opening of mouth upto 10 millimeters and diagnosed with oral submucosal fibrosis were selected by simple random selection

OBJECTIVES (1) To evaluate the role of coronoideotomy along with fibrectomy and interpositional grafting in OSMF patients (2) To assess whether coronoideotomy has any effect on long-term improvement in Mouth opening.

RESULT In the 30 cases in our series in which coronoideotomy was removed, the average intraoperative mouth opening was 41.53 mm, which at six months follow up was 36.53 mm and at twelve months follow-up was 35.06 mm.

1. Introduction

Oral submucosal fibrosis (OSMF) is reported in Indian literature since the time of Sushruta as Vidari [1]. It was first described in modern literature by Schwartz in 1952 and referred to as “idiopathic tropica mucosae oris” [2].

OSMF is a chronic, progressive, scarring disease that primarily affects people of South Asian origin and characterized by juxtaepithelial inflammatory cell infiltration followed by fibrosis in the lamina propria and submucosa of the oral cavity[3][28][37]. This prolonged condition involves submucosal membrane and masticatory muscles, resulting in difficulty opening the mouth.[26]

The aetiology of this disease is unclear. It is firmly assumed that there is a definite link between this disease and consumption of betel nut.[4][29]

The most widely accepted definition of this disease by Pindborg and Sirsat suggests that “it is an insidious, chronic disease affecting every part of the oral cavity and sometimes the pharynx.”[5]

Surgical treatment is needed in severe cases where the mouth opening is < 10 mm.[43] The operation involves the bilateral release of fibrous ligaments with intervening graft material to reduce the risk of fibrosis.

In OSMF, coronoideotomy is recommended with bilateral fibrotomy to reduce the risk of recurrence due to temporalis muscle spasm.

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Cutting the coronoid process at the level of the sigmoid notch and excising the process is known as a coronoidectomy. This study assessed how postoperative mouth opening was affected by coronoidectomy as an adjuvant treatment.

For the removal of fibrous bands under G.A., 30 patients with OSMF and a mouth opening of 10 mm or less were chosen. A buccal fat pad was used to restore the recipient defect following bilateral vitrectomy and coronoidectomy. The patients were monitored for a full year.

2. Materials and Method

Patients with OSMF received care at the Karnavati School of Dentistry, Uvarsad's Department of Oral and Maxillofacial Surgery. Before the study began, the committee gave its ethical blessing.

Patients having a history of chewing tobacco, betel nuts, or supari (with or without lime) who had given up this behaviour at least six months before surgery and had been evaluated for OSMF with symmetrical oral mucosal invasion with a mouth-opening of ten millimetres or less met the inclusion criteria. Patients who weren't cooperative, had poor health, had premalignant lesions or OSMF, weren't willing to give up a habit, weren't ready to come in for the prolonged follow-up, and weren't eager to take part in the research were all disqualified.

Patients were included as per inclusion criteria mentioned above. Medical history was taken from every individual with particular habits. Patients were examined, and their preoperative inter-incisal mouth opening (I.O.) was recorded. An orthopantomogram (OPG) was performed to rule out any pathology in the jaws, teeth and TMJ region and determine the need for third molar removal. Routine radiological and haematological examinations were carried out for surgical treatment. The doctor and anaesthetist examined all patients for surgery under general anaesthesia. Necessary dental prophylactic measures were carried out as indicated.

Surgical procedure: Patients were kept on NBM (Nill by Mouth) overnight before surgery. Shaving of the face and a betadine head bath was given on the day of surgery. Pre-operative antibiotic and analgesics were administered parenterally. Patients were explained about surgery and its possible surgical and post-

surgical complications. Written informed consent for general anaesthesia and surgery was taken from the patients and the patient's close relatives. Patients were taken into the operation theatre in a sterile gown.

Intra-operative procedure: All procedures were performed under general anaesthesia, and patients were intubated with fiberoptic nasotracheal intubation. The extraoral painting was done with 5% povidone-iodine and 70% alcohol. Covering was done with sterile towels. Intraoral lavage was performed with 5% povidone-iodine and normal saline. With the consent of the anaesthetist, two percent lidocaine hydrochloride with epinephrine (one in eight thousand) was injected into the operating site (to achieve hemostasis and proper tissue plane separation). A bilateral intraoral Y incision (two Y wings towards the corner of the mouth) was given using no. Fifteen blades on buccal mucosa at the occlusal plane level bilaterally, taking into account position of the opening of parotid salivary gland canal.

Incision extends backward upto the pterygomandibular raphe or anterior palatine columns (to the extent of fibrosis) using a long and angled B.P. handle. The incision extended to the depth of the submucosal layer, and the wound created was further dissected by manipulating the fingers and the curved artery until no restriction was felt. The mouth was then forced open as wide as possible with Heister's mouth gag. Then the mouth opening was measured intraoperatively. Partially erupted and impacted third molars were removed in all cases. The intraoral fibrectomy incision was extended vertically along the coronoid process to its apex. The temporal attachment at the anterior border of the ramus was removed along with the coronoid processes using the same incision. The osteotomy cut was made from the sigmoid notch's depth to the ramus's anterior border while grasping the coronoid with Kochers forceps. After the osteotomy was completed, Kocher forceps were used to pull the coronoid while the remaining temporal muscle and tendon attachments were severed to facilitate the removal of the coronoid.

On the other side, the identical process was used. Then, the buccal fat pad (BFP) was made visible. Just below the maxillary gingivobuccal groove, local anaesthesia was administered into the buccal mucosa. A 2 cm posterior incision that runs horizontally from the buccinator muscle through the gingivobuccal sulcus and the parotid duct papilla, starting 5 mm above the

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second molar. The surrounding fascia of the BFP are loose, and when they are cut, the BFP is easily removed. The fat can be expressed intraorally with the help of gentle cheek pressure. The BFP is gently removed from its bed and progressed to its new

position either by direct rotation or tunnelling under the surrounding tissues once it has been dissected free of the surrounding tissues. The graft was then secured with 4-0 vicryl suture material (Johnson & Johnson LDT.) Ryle's tube was passed and secured.



Figure 1a: Pre-operative mouth opening



Figure 1b: Intra-operative mouth opening



Figure 1c: 12 month follow up



Figure 2a: Pre-operative mouth opening



Figure 2b: Intraoperative mouth opening with coronoidectomy



Figure 2c: 12 months follow up

Figure 2: Fibrectomy + Coronoidectomy + Buccal Fat Pad (CASE 2)

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Post-operative management:-For one week, all patients were given antibiotics and liquid formula. Regular intraoral rinsing and gargling with betadine mouthwash kept oral hygiene in check. On the first postoperative day, Heister began intensive physiotherapy with a mouth gag. After three days, the Ryles tube was withdrawn. Patients were instructed to continue physiotherapy activities on a regular basis and to practise good mouth hygiene.

Follow-up:-Patients were discharged with stringent orders to continue extensive mouth-opening exercises, stop habits, and maintain dental cleanliness. They were contacted the following day, three days later, and one week later for normal follow-up. Mouth opening was examined at 15 days, one month, six months, and twelve months of follow-up, as well as wound healing. The data was then analysed.

3. Results

Table 1: DATA OF PATIENT

Sr.no	Age	Gender	Preoperative mouth opening	Intra-operative mouth opening	1 week followup	15 days followup	1 month follow up	6 month follow up	12 month follow up
1	31	1	8	42	39	38	36	35	30
2	21	1	9	42	41	38	36	35	32
3	30	1	10	41	40	38	35	34	28
4	33	1	10	43	42	42	38	36	32
5	40	1	8	42	41	39	37	36	31
6	32	1	10	45	43	41	41	39	37
7	51	2	8	39	38	38	37	36	35
8	45	1	10	46	44	43	41	40	38
9	35	1	8	32	31	28	27	25	25
10	28	2	4	33	32	30	28	27	27
11	47	1	7	40	39	37	36	36	35
12	29	1	6	42	40	39	39	38	37
13	37	2	8	46	43	43	42	41	39
14	33	1	9	42	38	37	37	36	35
15	28	1	10	39	37	36	35	35	34
16	49	1	5	43	40	39	37	37	36
17	31	2	8	39	37	37	36	36	35
18	26	1	4	45	44	44	43	41	41
19	34	1	9	40	38	38	37	36	36
20	44	1	10	40	38	38	38	36	35
21	41	1	7	46	45	45	43	42	42
22	35	1	9	44	42	42	40	39	39
23	40	1	6	39	38	38	37	36	36
24	30	2	4	41	38	38	36	35	35
25	41	1	8	45	44	42	41	41	39
26	48	1	9	40	38	38	37	36	35
27	29	2	6	41	39	39	37	37	36
28	23	1	9	42	40	39	38	37	37
29	25	1	8	46	44	43	42	42	40
30	42	1	10	41	39	39	37	36	35

The mean intraoperative mouth openness in our 30 instances when the coronoid was excised was 41.53 mm, 36.53 mm at six months, and 35.06 mm at 12

months. (Table 1)Data dependability was found to be substantial (p0.05). There was a substantial change in mouth opening between the preoperative and

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subsequent follow-up periods, indicating that coronoidectomy was effective in all 30 patients and that included coronoidectomy will result in significant differences in results.

Furthermore, OSMF patients should now always receive a fibrotomy.

4. Discussion

“OSMF is a slowly progressive disease in which fibrous bands cause blanching of oral mucosa, resulting in severe restriction of mouth opening.” (WHO)^[17]

OSMF is a cancerous oral cavity illness that is more frequent in Asian countries. It is a major oral health issue in nations such as India, owing to the intake of smokeless tobacco products such as areca nut. A burning sensation is followed by a restricted mouth opening as clinical symptoms.^[18]

According to Chandramani B. More and Sunanda Das (2011), OSMF is more common in the 2040 age range, however, it can occur in any decade. The condition was found to be most prevalent in people aged 20 to 30 years old [10]. In India, the prevalence rate is at 0.20.5%, and the prevalence varies by sex, ranging from 0.2% to 2.3% in men and 1.2% to 4.57% in females^[9].

Our study included 30 patients, with the youngest being twenty-one years old and the oldest being 51 years old. The majority of patients were between the ages of 21 and 45. As a result, the majority of patients were in their twenties. Males are more likely than females to have the condition; in ten individuals, 2 (20%) were female and 8 (80%) were male. The disease's aetiology is yet unknown. It is widely assumed that there is a clear link between this ailment and the long-standing practise of utilising the areca nut as a breath freshener in Indian history and culture.^[4] Without cigarettes, betel quid raises the likelihood of oral submucosal fibrosis.^{[36][38]}

According to Khanna & N. Andrade, areca nut is the main etiological factor for

OSMF^[10].

According to Kerr, S. Warnakulasuriya (2011), "Conclusive evidence now exists showing that OSF is caused by areca nut, a masticatory stimulant used primarily by peoples of South and S.E. Asian ethnicity,

in neighbouring geographic regions, and in the diaspora from that place" [20].

The average onset of the disease was six months to 1 year. 80% of the patients had the disease for more than six months.

The current protocol for managing OSMF can be divided into three broad groups: surgical, physical and medical treatments ^[21].

Physical treatment attempts to remodel tissue through movement, i.e., Physiotherapy.

Vitamins and antioxidants from food are employed in medical therapy. B. the use of anti-cytokines, proteolytic enzymes (like hyaluronidase), anti-inflammatory medicines (mainly steroids), and other pharmaceuticals. They can be ingested, used topically, or submucosally injected.^{[31][32]}

Removing and disclosing the fibrotic areas as part of the most popular surgical therapy for trismus results in further scarring and fibrosis. The insertion of excised tissue (pedicled, which might be a buccal fat pad, nasolabial or platysmal flap, or free tissue transfer) after fibrotomy helps to avoid fibrosis [44].

All patients in this study had surgical treatment, which included bilateral coronoidectomy, buccal fat pad grafting, and release of fibrous bands.

R. Martin-Granizo, L. Naval (1997) noticed the high success rate of the BFP (96.7%)

stands out in their study. The buccal fat pad can close the defect up to 60 x 50 x 30 mm^[22].

PBFPF is a straightforward, simple, and useful reconstruction approach with few risks, according to Sheng Po Hao's 2000 intraoral reconstruction employing a pedicled buccal fat pad on 21 individuals with oral cavity cancer. BFP is a readily available matured fat tissue that can be utilised as a pedicle flap to address surgical defects in the mouth cavity. It is located in the oromaxillary region.

The PBFPF is considered a trusted choice for reconstructing smaller oral mucosal lesions. In patients with submucosal fibrosis, it can help restore the physiology of their cheeks^[23].

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Rohit Sharma, G. K. Thapliyal, Ramen Sinha, and P. Suresh Menon (2011) concluded that BFP works well as a pedicle graft in the surgical treatment of OSMF [24].

In the therapy of OSMF, coronoidectomy greatly enhances mouth opening. To alleviate severe trismus produced by the disease's atrophic alterations to the temporalis muscle tendon. According to a study done by Amal Suresh et al., the temporalis muscle was evaluated histopathologically at the cellular level. As a result, coronoid-ectomy and temporalis myotomy were performed as part of the operation.[43]

73% of patients with a jaw opening of 35 to 45 mm had coronoidectomy, according to Yang-Ming Chang and Chi-Ying Tsai's 2004 study. They found that coronoidectomy resulted in an intraoperative increase in the interincisal distance from an average of 26.9 millimetres (which varied from 20 to 35 mm) to an average of 39.6 millimetres (range 35 to 45 mm). The interincisal range, however, shrank to a mean dimension of 32.9 mm (range 20 to 42 mm) at a subsequent follow-up [25].

Kothari et al. investigated 10 patients who had undergone surgery for oral submucosal fibrosis, including a pedicled buccal fat pad graft, symmetrical coronoidectomy, masseter myotomy, and intensive mouth opening exercises. The interincisal distance at the maximal mouth opening was used to measure the result over a 12-month period. According to the findings, the average interincisal opening was 14.7 mm prior to surgery and 32.5 mm 12 months afterwards. Coronoidectomy and bilateral fibrotomy had encouraging outcomes, according to the findings.

In the 30 patients in our series in which coronoid was removed, the average intraoperative mouth opening was 41.53 mm, which at six months follow up was 36.53 mm, and at 12 months, the follow-up was 35.06 mm. Thus, after one year of postoperative follow-up, inter-incisal mouth opening was stable after coronoidectomy. This improved the nutritional status of the patient and boosted their confidence leading to improved quality of life. The results achieved in our study were remarkable in terms of maximum mouth opening compared with the studies mentioned above.

Early postoperative exercise, intensive postoperative physical therapy, and stringent follow-up care are all crucial for preventing postoperatively shrinkage and

adhesions in OSMF, according to Hemant Gupta and Parul Tandon (2014)[14].

In our trial, we also began vigorous mouth-opening exercises for all 30 patients within 24 hours of surgery and continued them for at least six months.

5. Conclusion

OSMF is a disabling disease that is quite common in India owing to the practise of chewing tobacco. Chewing betel nuts was a common factor in all of our study's participants, implying a link between this ailment and the practise of chewing betel nuts.

For Stage III and Stage IV OSMF patients, surgical removal of fibrous bands followed by defect repair with an interpositional flap remains the therapy of choice.

However, in OSMF patients, we advocate coronoidectomy as a beneficial technique in addition to the basic surgical procedures of fibrotomy and interpositional grafting since it results in a large increase in mouth opening.

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