Bilateral inferiorly based nasolabial flaps for the management of advanced oral submucous fibrosis

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Abstract

Objectives To study the usefulness of bilateral inferiorly based nasolabial flap in the management of advanced oral submucous fibrosis in patients with interincisal opening (IIO) 15mm.

To measure the Interincisal Opening (IIO), preoperatively, intra-operatively and at regular intervals during the follow-up period.

To assess the vascularity and viability of the flap on the 1st, 7th and 21st postoperative days.

Methods 6 medically fit patients with a chief complaint of restricted mouth opening and interincisal opening less than 15 mm were chosen for the study.

All the cases were diagnosed as advanced oral submucous fibrosis based on long-standing positive history of habits (chewing tobacco, betel nut etc.), clinical examination and histopathological examination.

Intra-oral incisions were taken on the buccal mucosa for release of bands. All third molars were extracted. Bilateral intra-oral coronoidectomy was done if IIO less than 35 mm was achieved intraoperatively. Bilateral nasolabial flaps were raised in the supramuscular plane and transferred intra-orally through a transbuccal tunnel. Periodic evaluation of the interincisal opening and pin prick test of the flap (to assess vascularity) was carried out.

Results There was no incidence of infection in the transferred flap and the recipient site in all cases. Complications due to vascularity (blue flap or white flap) were not encountered. In our series of nasolabial flaps, flap loss either complete or partial was not encountered. Other complications like flap necrosis, damage to parotid duct, ectropion were not observed.

After release of fibrotic bands a mean forced intraoperative mouth opening of 41.7 mm was achieved. On the first postoperative day a mean unforced mouth opening of 21.7 mm was achieved. Mean mouth opening of 39.6 mm was achieved at 6 months, with a mean increase of 26.8 mm.

Two of our cases required coronoidectomy since the intraoperative mouth opening achieved was less than 35mm.

Conclusion The nasolabial flap is a versatile flap, which can be successfully used in the reconstruction of defects created after the release of fibrotic bands. This flap is a good solution for the functional problems but the inevitable scar created becomes a drawback and may require a revision.

All the cases treated for oral submucous fibrosis using bilateral nasolabial flaps showed adequate mouth opening at 6 months postoperatively, recommending its use.

Keywords Oral submucous fibrosis · Nasolabial flaps

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Introduction

Oral Submucous Fibrosis (OSMF) has a multi-factorial etiology. Suggested contributory factors include areca nut chewing, ingestion of chilies, nutritional deficiencies, genetic and immunologic processes, and other factors. Presenting symptoms are burning pain, progressive inability to open the mouth, difficulty in mastication and swallowing [1].

The surgical procedures for the management of advanced oral submucous fibrosis include excision of fibrous bands with or without coverage of the surgically created defect [6]. The versatility of the nasolabial flap has been attributed to its reliable vascularity derived from numerous vessels in the vicinity. It is advocated because of ease of elevation, proximity to the defect, suitable size for coverage of defect, minimal swallowing and speech difficulties and a relatively cosmetic result as scar is in natural crease [2].

Methods

This study was carried out in the Department of Oral and Maxillofacial Surgery, Bharati Vidyapeeth University, Dental College and Hospital, Pune. 6 medically fit patients (4 male and 2 female patients) in the age range of 25–45 years were chosen for the study. All patients had a chief complaint of restricted mouth opening (less than 15 mm). Duration of affliction ranged from 8 months to 3 years.

All the cases were diagnosed as advanced oral submucous fibrosis based on long-standing positive history of habits (chewing tobacco, betel nut etc.), clinical examination and histopathological examination. Inclusion criteria were medically fit patients with advanced oral submucous fibrosis with interincisal opening less than 15 mm (measured from the mesioincisal edge of the maxillary central incisor to the mesioincisal edge of the mandibular central incisor).

Preoperative evaluation consisted of a detailed case history, clinical assessment, routine investigations, orthopantomogram and preanaesthetic evaluation.

Procedure

All the procedures were carried out under general anesthesia using nasotracheal intubation with flexible fiberoptic bronchoscopes. The intra-oral incisions

were made bilaterally to release the fibrous bands using electrocautery or knife along the buccal mucosa at the level of occlusal plane 1 cm from the corner of mouth and extended posteriorly upto the anterior faucial pillars. The collagen bands were incised upto the muscle layer. After the release of fibrotic bands, a defect of approximately 5.5 cm x 2 cm was created. Using Fergusson's mouth gag forcible mouth opening was carried out. Interincisal distance was measured and a bite block was placed. If the interincisal distance was less than 35 mm, intra-oral coronoidectomy was performed. All third molars were removed at this stage.

The flap was outlined on cheek and raised with sufficient subcutaneous tissue and fat to ensure a good blood supply and adequate bulk but remained superficial to facial muscles. The medial incision line followed the nasolabial fold on superior two thirds and was placed 3–4 mm medial in inferior one third. The base of flap was 1.5 to 2.5 cm wide. Width greater than this makes rotation of flap difficult while narrower than this compromises the blood supply. The medial and lateral incision lines tapered superiorly approximately 0.5 to 0.75 cm inferior to medial canthus. The inferior limit of the flap was at the level of oral commissure. Flap was raised from superior to inferior in supramuscular plane by using dissecting scissors. The angular branch was tied off. The transbuccal tunnel was made in the region of the modiolus just medial to the pedicle. The flap was then transferred into the oral cavity in a tension free manner. Intra-orally the flap was sutured by placing interrupted sutures using 3-0 vicryl. Donor site was closed primarily in layers using 3–0 vicryl suture for deeper layer and 5–0 prolene/ethilon for final skin closure.

Nasogastric feeding was carried out for 7 days postoperatively.

Antibiotics, analgesics and supportive medications were administered.

A mouth prop was placed in mouth to maintain the interincisal distance for first 48 hours. The mouth was covered with wet gauze to prevent dryness of mouth. The prop was removed intermittently, every two hours for fifteen minutes. Interincisal opening was measured daily for first 7 days and physiotherapy was advised. Mouth opening exercises using Hiester's mouth gag were taught. IIO was maintained over 35 mm for 7 days in all cases during immediate postoperative period.

Flap viability was checked using needle prick at the most distal tip of flap in the

retromolar area after 24 hours, 48 hours, 7 days and after pedicle division respectively. Success of the flap was determined 7 days after pedicle division by reassessment of vascularity, adaptability to underlying surface and appropriate coverage of the raw surface following excision of bands and evaluation of scar [7]. Usefulness of flap was determined by assessing whether flap dimensions were adequate to cover the exposed area and if it prevented scar contracture thus maintaining the increased interincisal opening [4,5]. All sutures were removed between 5th–10th postoperative day.

Flap division was done after three weeks and also the unaesthetic triangular base of the scar was corrected if required. Patients were evaluated for IIO [3] and various other parameters regarding the surgical procedure daily for first seven days then weekly till four weeks and then monthly for first six months.

Results

There was no incidence of infection in the transferred flap and the recipient site in all cases. Complications due to vascularity (blue flap or white flap) were not encountered, except for slight ecchymosis at the flap tips and suture margins, which subsided after 7–10 days postoperatively. In our series of nasolabial flaps, flap loss either complete or partial was not encountered.

Other complications like flap necrosis, damage to parotid duct, ectropion were not observed.

After release of fibrotic bands a mean forced intraoperative mouth opening of 41.7 mm was achieved. On the first postoperative day a mean unforced mouth opening of 21.7 mm was achieved. Mean mouth opening of 39.6 mm was achieved at 6 months, with a mean increase of 26.8 mm.

Two of our cases required coronoidectomy since the intraoperative mouth opening achieved was less than 35 mm.

No major vessel damage in the operative region was encountered.

Discussion

In our series of patients bilateral inferiorly based nasolabial flap with a reliable subdermal plexus were used for the treatment of advanced oral submucous

Table I Preoperative evaluation

Case No.	Age/Sex (years)	Chief complaint	Type of habit (with duration)	Previous treatments taken	Stage of presentation
1.	29/M	Burning sensation & limitation of mouth opening since 1 year	Gutka, 4–5 pkt/day; 11 years	Intralesional injections, topical medications, antioxidants. 2 times laser excision of bands 6 months back	IVa
2.	23/M	Progressive decrease in mouth opening since 10 months	Zarda, 10–15 pkt/day; 6 years	Intralesional injections, topical medications, antioxidants.	IVa
3.	27/M	Inability to open mouth since 1½ years	Betelnut, 5–6 day, 7–8 years	Intralesional injections, topical medications, antioxidants. Excision of bands only. 1 year back	IVa
4.	36/F	Inability to open mouth since 1½ years	Supari, 4–6/day, 15–18 years	Intralesional injections, topical medications, antioxidants.	IVa
5.	37/F	Inability to open mouth since 2 years	Pan masala 8 pkt/day, 4–5 years	Intralesional injections, topical medications, antioxidants.	IVa
6.	40/M	Inability to open mouth since 8 months	Gutka 9–10 pkt/day since 15 years	Intralesional injections, topical medications, antioxidants.	IVa

fibrosis. The dimensions of the flap were adequate to cover the intra-oral defect and layered closure of donor site was achieved to minimize postoperative extra-oral scar. Intraoperative complications like damage to facial vessels, parotid duct and branches of facial nerve were not encountered in any of the patients included in the study.

None of the flaps showed either bluish or whitish discoloration in the postoperative phase and no infection was encountered in any of our cases. Complications such as flap loss, flap avulsion, obstructive sialadenopathy or wound dehiscence were not encountered in our series. No intra-oral hair growth was seen.

Table II Inter-incisal opening **Fig. 1** Interincisal opening H" 10 mm **Fig. 2** Extraction of all 3rd molars **Fig. 3** Excision of bands done intra-orally

Table III Immediate postoperative assessment

Findings	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Flap colour (maintained/not maintained)	Normal	Normal	Normal	Normal	Normal	Normal
Flap bulk adequate/inadequate excessive	Adequate	Excessive	Adequate	Adequate	Adequate	Adequate
Flap/loss partial/complete	No	No	No	No	No	No
Flap margins	Distal tip revision	Coapted	Coapted	Coapted	Coapted	Coapted
Sloughing	No	No	No	No	No	No
Hair growth	No	No	No	No	No	No
Healing	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Fistula	Yes	No	Yes	No	No	No
Scarring (Extra-oral)	Hypertrophic	Acceptable	Acceptable	Hypertrophic at base	Acceptable	Acceptable
Secondary intervention	Scar revision, Fistula closure	No	Fistula closure	No	No	No

Table IV Comparison of mouth opening on follow-up visits

Case No.	Preop IIO	Intra-op IIO	Postoperative mouth opening														Increase in IIO (mm)	% Increase	
			Days				Weeks				Months								
			1st	2nd	3rd	4th	5th	6th	7th	2nd	3rd	4th	2nd	3rd	4th	5th	6th		
1.	10	45	28	26	30	32	35	32	30	30	36	42	41	42	40	42	42	32	320%
2.	13	45	26	25	30	32	33	33	32	36	38	38	40	42	40	41	42	29	223.1%
3.	14	42	20	22	23	27	30	29	32	32	32	33	35	36	35	36	40	26	185.7%
4.	15	40	18	16	22	21	25	24	29	29	33	31	35	37	38	37	38	23	153.3%
5.	12	40	16	18	20	24	26	27	28	28	30	30	36	38	36	37	37	25	208.3%
6.	13	40	22	18	24	26	28	28	28	29	28	34	38	36	38	39	39	26	200%

In our series we encountered orocutaneous fistulas in two of the cases because of insufficient de-epithelialization of base which were corrected at later date.

Postsurgical scars were barely perceptible in four cases. Two cases required scar revision after 3 months.

Definite increase in mouth opening was observed over the first four postoperative weeks, three months and at six months period. The mean preoperative mouth opening was 12.8 mm. The mean mouth opening at the 4th postoperative week was 34.7 mm, at 3 months was 38.5 mm and by the end of 6 months an increase to 39.6 mm was noted. Hence a mean increase in mouth opening was 26.8 mm.

This study was reinforced by Balaji SM [2] compared the pedicled lingual and nasolabial flap for treatment of patients with advanced oral submucous fibrosis. He supported the nasolabial flaps interpolated into the oral cavity as an expedient solution to soft tissue deficit produced after excision of bands.

Ducic Y and Burye M [4] described the successful use of pedicled nasolabial flaps in the reconstruction of various oral cavity

Fig. 4 Transbuccal tunnel preparation by blunt dissection

Fig. 5 Nasolabial flaps raised and transferred intra-orally through transbuccal tunnel

Fig. 6 Transfer of flap intra-orally through transbuccal tunnel

Fig. 7 Interincisal opening 42 mm – 6 months postoperative

defects with or without adjunctive microvascular free tissue transfer. The use of the nasolabial flap appeared to provide an improvement in overall functional outcome. They concluded that the inferiorly based nasolabial flap provided reliable coverage of intermediate size oral cavity defects when used alone.

Morgan RF et al. [5] reported their experience with nasolabial flaps treated for intra-oral reconstruction, which were followed for 1 to 10 years. They obtained successful reconstruction without complication was obtained with 93 percent of flaps. They concluded that nasolabial flap proved very useful in immediate single-stage reconstruction of anterior intra-oral defects.

Conclusion

Numerous treatment modalities (both medical and surgical) have been employed for the treatment of OSMF.

Nasolabial region has an excellent dual blood supply, which assures the successful take-up of the flap. The interincisal opening achieved was maintained with minimal relapse till last follow-up. No partial or complete flap failures were noted in our series of cases. The technique of harvesting the nasolabial flap is simple. The donor site is in close proximity to the defect. Based on our study, we conclude that the nasolabial flap is a versatile flap, which can be successfully used in the reconstruction of defects created after the release of fibrotic bands.

This flap is a good solution for the functional problems but the inevitable scar created becomes a drawback and may require a revision.

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