Lip repositioning surgery: A pioneering technique for perio-esthetics

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Abstract

In our esthetic conscious society people are now demanding all types of treatments possible to have a pleasing and attractive personality. A dazzling and beautiful smile can work wonders for anyone's personality. Our smile mirrors our persona, our unique being. However, a beautiful smile comprises of a perfect balance of the white and pink. This imbalance of excessive gingival display (EGD) can be managed by a variety of treatment modalities, depending on accurate diagnosis. This case report demonstrates the successful management of EGD with a lip-repositioning procedure in a patient with incompetent short upper lip. This was accomplished by removing a partial thickness strip of mucosa from the maxillary buccal vestibule and suturing the lip mucosa to the mucogingival line. This resulted in a narrower vestibule and restricted muscle pull, thereby resulting in competent lips and reduced gingival display during smiling.

Keywords: Esthetics, excessive, gingiva, gummy, lip repositioning

Introduction

A dazzling and beautiful smile can work wonders for anyone's personality. Our smile mirrors our persona, our unique being. Gingival health and display are important constituents of an alluring smile. Excessive gingival display (EGD) commonly described as "gummy smile" is a frequent cause of patient dissatisfaction, which can occur because of various intraoral or extraoral etiologies.[1] The extraoral causes of a gummy smile are vertical maxillary excess (VME), hypermobile upper lip (HUL), or a short upper lip (SUL measured from the subnasale to the inferior border of the upper lip). The average length of the maxillary lip is 20-22 mm in young adult females and 22-24 mm in young adult males.[2] The intraoral cause for EGD is delayed eruption.[3] Various treatment modalities have been tried till date for the treatment of EGD which include orthognathic surgery's for correcting jaw deformity. Performing myectomies to detach the smile muscle attachment,[2,4] use an alloplastic or autogenous separator[2] which are placed with a nasal approach between the elevator muscles of the lip and the anterior nasal spine and lip repositioning has also been performed in conjunction with rhinoplasty.[2] Injections of botulinum toxin type A have been suggested for treatment of HUL.[5] Delayed eruption is treated by esthetic crown lengthening.[3] Thus it is vital that the clinician evaluate the essentials of the patient's smile and studies the dynamic association between the patient's dentition, gingivae and lips while smiling.[6] We report on the use of a minimally invasive surgical procedure for the management of a EGD associated with SUL.

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Case Report

A healthy 18-year-old girl presented with a chief complaint of a gummy smile [Figure 1] and incompetent lips [Figure 2]. She had undergone extraction and fixed orthodontic treatment for 1.5 years. Our treatment goal was to minimize gingival display (GD) in her smile. A thorough extraoral and intraoral examination was performed. Her upper lip was measured to be13 mm, which was short. A periodontal examination performed revealed moderate gingival biotype with probing depths in the range of 1-3 mm. The gingival line in the maxillary anterior sextant was found to be symmetrical and she had adequate width of attached gingiva. Her clinical examination showed moderate maxillary gingival display. The posterior extent of the dynamic smile extended to the distal aspect of the first molars, with 4-5 mm of excessive gingival tissue display and the maxillary anterior teeth had normal anatomic proportions. Two treatment options were presented to the patient: Maxillary orthognathic surgery or lip repositioning surgery (LRS). After careful discussion, the patient opted for the LRS as it was minimally invasive, less aggressive and had the potential for fewer postoperative complications.

A written informed consent was taken and the patient was educated about post-surgical complications such as possible scar formation, mucocele formation, post-operative bruising and extraoral swelling. Local anesthetic (Xylocaine with 1:200,000 adrenalines) was administered. A marking pen was used to outline the apical, coronal and lateral boundaries of the elliptical incision [Figure 3]. The coronal boundary was at the mucogingival junction and was used as a reference point to mark the apical boundary at a distance of 2 times GD. The coronal and apical incisions were parallel to each other and a partial-thickness incision was made at the mucogingival junction from the mesial line angle of the right first molar to the mesial line angle of the left first molar. The epithelium was removed within the outline of the incisions exposing the underlying connective tissue [Figure 4]. Care was taken to avoid damage to any minor salivary glands in the submucosa and tissue tags were removed. The mucosal flap was advanced and sutured with interrupted stabilization sutures at the midline and other locations along the borders of the incision mucogingival junction using 5-0 vicryl sutures [Figure 5]. No periodontal dressing was placed. Post-operative instructions included soft diet, limited facial movements, no brushing around the surgical site for 14 days and placing ice packs over the upper lip. The patient was instructed to rinse gently with 0.2% chlorhexidine gluconate twice daily for 2 weeks. Post-operative Amoxicillin 500 mg T.D.S and Ibuprofen 400 mg B.D for 5 days were prescribed. Post-operative healing occurred and the patient reported minimal post-operative bruising, or extraoral swelling and "slight pain when smiling for 1 week after surgery. Sutures were removed 2 weeks later. The suture line healed in the form of a scar that was concealed in the upper lip mucosa and not visible when the patient smiled. Reduction in the amount of GD at the 1-year follow-up visit was stable along [Figure 6] with competent lips [Figure 7].

Discussion

This report documents the use of LRS for the management of EGD seen with a SUL. The original technique for the procedure was described as cosmetic surgery by Rubinstein and Kostianovsky[7] for correction of a gummy smile caused by hypermobile lip. This surgical procedure was designed to have fewer postoperative complications when compared to orthognathic surgery besides being shorter and less aggressive. This procedure was re-advocated by Litton and Fournier[8] for the correction of EGD in a case of SUL by separating the muscles from the basal

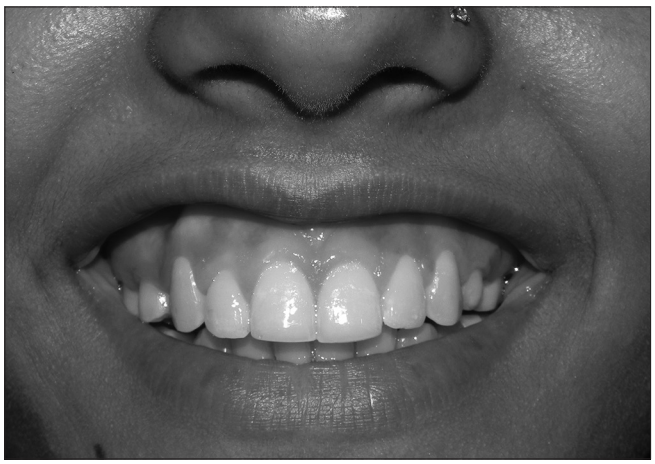

Figure 1: Pre-operative view smiling

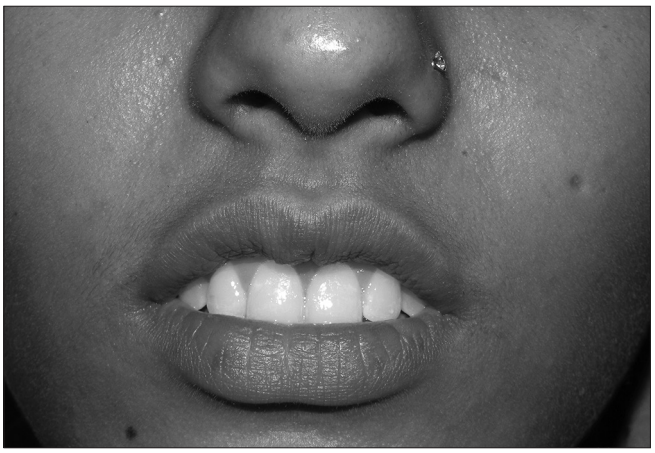

Figure 2: Pre-operative view showing incompetent lips

Figure 3: Incision marking

Figure 4: Exposed connective tissue

Figure 5: Suturing done with interrupted sutures

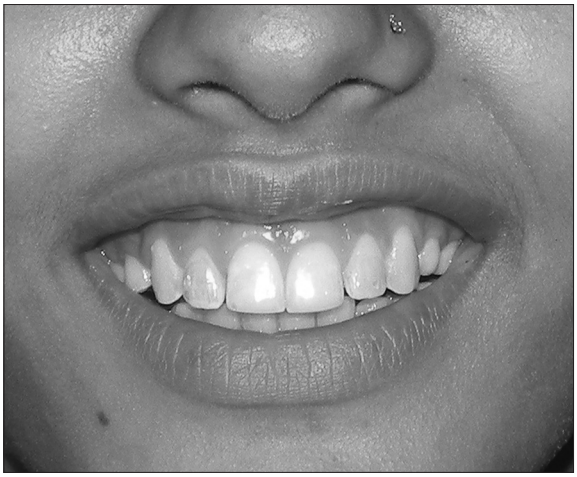

Figure 6: Post-operative view smiling

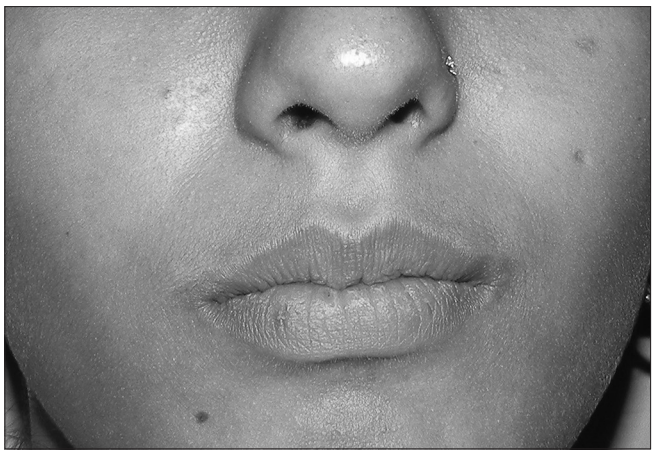

Figure 7: Post-operative view with improved lip competency

bony structures to coronally place the upper lip. This surgical procedure reported no complications but there were reports of relapse. Thus this technique was further improvised by Miskinyar[9] to correct the relapse. The trial treatment group consisted of seven patients who had relapse. Miskinyar however did not report when or how much relapse had occurred in his patient group. These patients were reoperated using a more aggressive approach which included myectomy and a partial resection of the muscle- levator labii superioris along with nerve repositioning before muscle resection. This was thought to eliminate muscle regeneration thus making the results more permanent. The only post-operative complication reported by the author was a postoperative paraesthesia that lasted 2.5 months for one patient.

Case reports by Rosenblatt and Simon[3] and Simon *et al*.[10] used an elliptical-shaped incision at the mucogingival junction and the alveolar mucosa, to reflect a partial-thickness flap, and an arbitrary excision of 10 to 12 mm of epithelium. They reported good results in one case of 8-month follow-up. Similar surgical procedure has been reported by Humayun *et al*.[1] with one year follow-up providing good results.

Accurate diagnosis and a pertinent case selection are critical for the success of any LR procedure. Contraindications to LR surgery include the presence of a minimal zone of attached gingiva, which can create difficulties in flap design, stabilization, and suturing, and severe VME (>8 mm of gingival display).[3,10]

Conclusions

This case report demonstrates that LRS may be used effectively for treatment of excessive GD caused by SUL by positioning the upper lip in a more coronal location. Our results showed comparatively good stability at the 1-year follow-up. Proper diagnosis evaluation of the severity of VME, HUL, or a short lip and an appropriate case selection are critical for the success of any surgical procedure. It is a less invasive, viable substitute for patients, has fewer post-operative complications and provides a faster recovery compared to orthognathic surgery. Long-term follow-up studies are needed to evaluate the stability and effectiveness of this treatment modality, but it holds promise as an alternative treatment modality in perio-esthetics.

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