Case Report

Smile Correction through Lip Repositioning: A Series of Ten Cases

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Abstract

Excessive gingival display is often very disturbing as it is considered unaesthetic by many. Acceptable gingival display is in the range of 2–3 mm, and anything beyond may require surgical procedures for correction. Many of the procedures advocated are extensive and had substantial morbidity associated with it. Here, we present a series of ten cases where excessive gingival display was managed through lip repositioning technique under local anesthesia. All the cases had good prognosis and none of them exhibited recurrence in 6 month follow-up.

Keywords: Gummy smile, Hyperactive muscle, Lip repositioning, Myotomy.

Introduction

Gummy smile is often considered unaesthetic by patients. Although some amount of gingival display is acceptable, excessive gingival display can be intimidating. A normal gingival display between inferior border of upper lip and gingival margin of the upper central incisors during smile is 1–2 mm. Gingival to lip distance of 4mm or more is considered unattractive by lay people. Excessive gingival display can be due to various reasons. One possible cause is delayed eruption in which gingival fails to complete apical migration. Second possible cause is compensatory eruption of maxillary teeth along with attachment apparatus. Vertical maxillary excess with incompetent lips can cause excessive gingival display. Fourth possibility is forced or exaggerated smile pattern exposing dentition and gingival excessively.[1]

Case Report

Healthy patients in the age group od 21–35 who reported to our institute with chief complaint of excessive gingival display from year 2018 to 2019 were selected for the procedure. A diagnosis of hyper mobility of lip was made in most of the patients. Selected patients had a gingival display of 4–6 mm. Few cases had moderate maxillary vertical excess. However, proposal for orthognathic surgery was denied and patient preferred a less invasive procedure and informed consent for lip extension procedure was obtained. Total of seven female and three male patients opted for the procedure. All procedures were done under local anesthesia and patients returned home same day. Regular 6 months to 1 year follow-up was made.

Surgical site was anesthetized from first molar of one side to first molar of other side by local infiltration with local anesthetic solution. Incision outline was marked with surgical marker pen (Figure 1). All patients were demonstrated with planned lip position prior to surgery by suturing. First incision is given at the mucogingival junction and a partial thickness flap is elevated. Second incision is given 10–12 mm above the first incision in the labial mucosa. A strip of partial thickness flap was removed exposing the connective tissue. The first and second incision lines are approximated with simple interrupted sutures after placing the midline suture first, which will maintain the midline as well as the "gull wing" design of the smile (Figure 2). Patients were prescribed with amoxicillin 500 mg TID along with diclofenac 50 mg TID for 5 days. Patient presented with slight pain and increased tension on lips while smiling 1 week postoperatively. Suture removal was done

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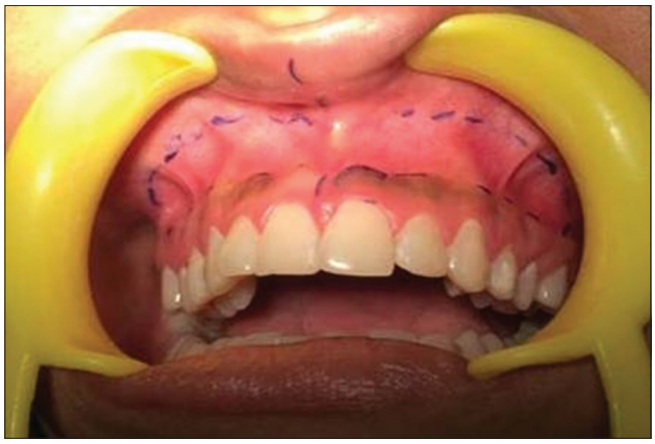

Figure 1: Incision marking

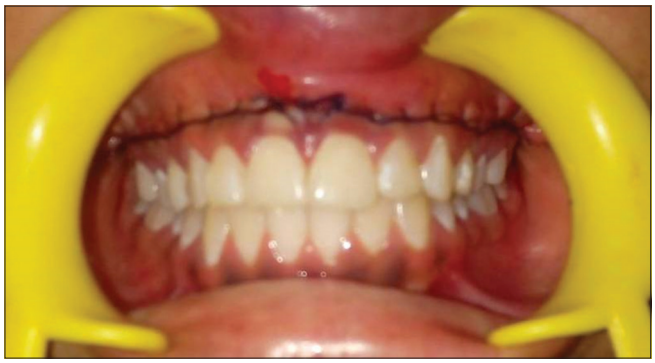

Figure 2: Suturing

after 2 weeks and healing was uneventful. Three to four millimeters reduction in gingival display was achieved in all patients. Suture removal was done after 2 weeks and healing was uneventful. The combined reduction in soft tissue and contraction of the healed suture line adequately reduced the gummy smile (Figures 3 and 4).

Discussion

Many techniques have been employed in correction of excessive gingival display. This includes crown lengthening procedures, orthodontic leveling of gingival margins by maxillary teeth intrusion, orthognathic surgery for correcting vertical maxillary excess, lip repositioning procedures, and nonsurgical procedures like Botulin injections.[2] Identifying the etiology for increased gingival display determines the treatment plan. Excessive gingival exposure during smile is referred to as gummy smile and is an esthetic concern for most of the patients. It is diagnosed in cases, where gingival appearance is excessive that is, ≥3 mm from gingival margin up to the upper lip line.

In the literature, different techniques have been reported for the treatment of hyperactive upper lip. Injections of Botulinum toxin, lip elongation associated with rhinoplasty, detachment of lip muscles myotomy and partial removal, and lip repositioning are some among them.[2]

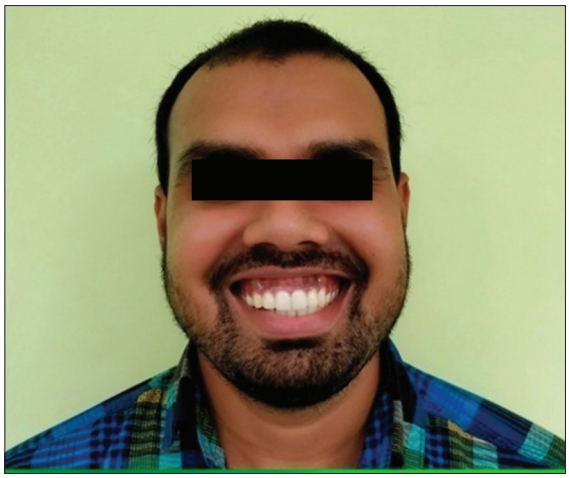

Figure 3: Pre-operative

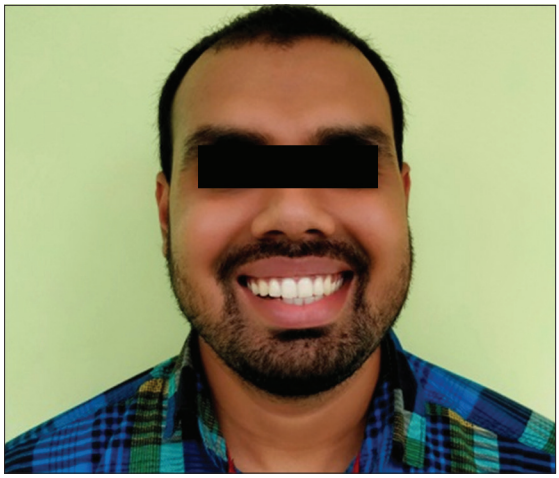

Figure 4: Post-operative

Labial hyperactivity is characterized by marked contraction of the upper lip elevator muscles that is zygomaticus minor, levator anguli, orbicularis oris, and levator labii superioris.[3]

In patients with hyper mobile upper lip there is an undesired visibility of gingiva during normal smile. Lip repositioning surgery for correction of excessive gingival display was first described in 1973 by Rubenstein and Kostianovsky.[4] We intended to report a series of ten cases were lip repositioning surgeries and were performed to correct gummy smile.

Lip repositioning surgeries includes severing of upper lip muscle attachment after flap elevation. But removal of some amount of soft tissue along with scar contracture limits the pull of elevator muscles and limits the upward displacement of lip while smiling. This older technique was done by detaching the muscles from the bone to coronally position the upper lip with no reported complications. Due to the occurrence of relapse, Miskinyar, in 1983 modified the original technique into myectomy and partial resection of the levator labii superioris instead of complete separation from the bone. This resection was believed to reduce chances

of relapse.[5] Lip repositioning technique was designed to be shorter, less aggressive and to have fewer postoperative complications compared to orthognathic surgery.[6] Proper diagnosis of the etiological factors is the first step to select the right treatment protocol. The contraindications for this technique include the presence of a minimal zone of attached gingiva, which can create difficulties in flap design, stabilization and suturing. Another contraindication is severe vertical maxillary excess.[6]

To determine other factors that are not related with the hyperfunction of the upper lip elevator muscle, certain characteristics must be taken in account. Facial proportions must be symmetric in the three horizontal thirds, without identification of higher proportion of the inferior third, which could characterize an excessive maxillary vertical growth. Another factor to be evaluated is the distance between the gingival margin and CEJ, which ideally is <1.5 mm. Distances >1.5 mm indicate an excessive gingival tissue covering the tooth crown, typical in altered passive eruption.[7]

The results of the clinical cases show aesthetic satisfaction after 6 months of follow-up. Procedure described is a modified version of the original technique by Rubinstein and Kostianovsky. The amount of tissue removed, 10–12 mm, was the same in all the cases. The extent of upper lip mobility reduction was not predictable though satisfactory after 6 month follow up. The amount of lip reduction achieved was varying from 6 mm to 4 mm. Maintaining the midline and symmetry in lip reduction on both sides is important which can be achieved by premarking the midline, removing the same amount of tissue on either sides of the frenum and suturing the frenum first.

Conclusion

For patients and dental professionals who desire a more conservative technique, surgical lip repositioning is a viable alternative. In technique selection, the procedure shown in this case report could be the first choice because it is less invasive and presents good stability during the 6-month follow-up. 6 months follow-up showed no relapse and patients had a reduction of 3–4 mm reduction in gingival display. Lip repositioning technique is a simple procedure that offers an alternative to other extensive procedures with higher morbidity rates. All ten cases done met the functional and aesthetic parameters required by the patients and they were satisfied with the outcome of the procedure. More studies with a greater number of patients and with long-term follow-up are necessary to increase the level of scientific evidence for such procedures.

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