

# LIP RECONSTRUCTION OR LIP REARRANGEMENT : FUNCTIONAL AND AESTHETIC CONSIDERATION.

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## ABSTRACT

Excessive exposure of gingival tissue during smile has been a matter of aesthetic embarrassment for many patients. Excessive gingival display may not be present with any pathologic condition but it definitely affects the patient's psychosocial behaviour. This case report will highlight a surgical procedure to restrict hyperactive upper lip and a mild vertical maxillary excess by removing a strips of mucosa with the help of partial thickness from maxillary buccal vestibule on both the sides and suturing the lip mucosa with mucogingival junction, thereby reducing gingival display.

## KEY WORDS

**Gingival display, hyper-active upper lip, mild vertical maxillary excess.**

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## INTRODUCTION

A pleasing face is always accompanied with an aesthetic smile. Smile plays a beautiful role in physical attractiveness, social interaction, influences personality and initial impression in relationship. And the essential of a beautiful smile engross the balanced and harmony between the three primary components: the teeth, lip framework and the gingival scaffold<sup>1</sup>. Amount of gingival display is among the aspects that comprise smile aesthetic and plays an important role in smile attractiveness. A normal gingival display between the inferior border of the upper lip and the gingival margin of the anterior central incisors during a “normal” smile is 1-2 mm<sup>2</sup>. In contrast, an excessive gingival to lip distance of 4mm or more is classified as “unattractive”<sup>3</sup>. An excessive gingival display is prevalent in 10.5<sup>4</sup> % to 29%<sup>5</sup> of the population. Also affects approximately 10% of the population aged between 20 and 30 years old<sup>4</sup>. It is highly prevalent among women (14%) than man (7%)<sup>6,7,8</sup> and decreases with age due to loss of muscle tone in both upper and lower lips<sup>9</sup>. The lips form the frame of smile and as such, define the aesthetic zone<sup>1</sup>. The lip line, assessed when the patient is in full smile, can be classified according to Jensen et al. in 1999<sup>10</sup> as :

### Classification of smile line

Class	type: Description	Evaluation
Score 0	Low smile line	IDG: <25% visible M: Not visible, teeth masked
Score 1	Average /Ideal smile line	IDG: 25-75% visible M: Visible on individual teeth
Score 2	High smile line	IDG: >75% visible M: <3mm visible (overall)
Score 3	Very high smile line	IDG: Completely visible M: >3mm wide maxillary band Of gingival visible beyond the Mucogingival line “gummy smile”

IDG: Interdental gingiva ; M: Gingival margin.

Several conditions may result in the excessive display of gingival tissue, like pseudo pocket caused by gingivitis, drug-induced gingival enlargement and altered passive eruption of the maxillary dentition, a high lip line, vertical maxillary excess and a hyper active upper lip<sup>(11)</sup>. The treatment strategy depends on the specific etiologic factor involved in every cases.<sup>(12)</sup> In a case where gingival enlargement due to pseudo pocket can be corrected via crown lengthening<sup>(13),(14)</sup> or a gingivectomy procedure where the excess gum is removed to

expose the clinical crown. Excessive gingival display associated with a vertical maxillary excess is treated by orthognathic surgery performed by a maxillofacial surgeon in association with an orthodontist.<sup>(15)</sup> Patient diagnosed with a hyper active upper lip have been treated with several treatment options such as injection of botox<sup>(16),(17),(18),(19)</sup> (botulinum toxin); since the average gingival display will return to baseline values 6 to 8 months post injection, a permanent solution is desirable<sup>(20)</sup>. Lip repositioning is an option as an additional treatment modality for patients with excessive gingival display associated with hyper active lip<sup>(1),(12)</sup>. The objective of lip repositioning is to minimize the gingival display by limiting the retraction of the elevator smile muscles (e.g., zygomaticus minor, levator anguli oris, orbicularis oris and levator labii superioris) which is a modification of the technique proposed by Rosenblatt and Simon<sup>(21)</sup>, removing two mucosa strips from the maxillary buccal vestibule and creating a partial thickness flap between the mucogingival junction and the upper lip musculature. The lip mucosa is then sutured to the mucogingival line, resulting in a narrower vestibule and restricted muscle pull, thereby reducing gingival display during smiling<sup>(22)</sup>. This case report describes the modified lip repositioning technique in the treatment of excessive display caused by hyperactive upper lip.

## CASE REPORT

A 30-year, female patient reported to the Department of Periodontia, Dr. R Ahmed Dental College and Hospital, with the chief complaint of excessive display of gums while smiling. There were no significant medical or family history that could contradict the surgical procedure. On extra oral examination, no facial asymmetry, adequate lip length (M: 22-24mm; F: 20-22mm). However, the very high lip line (score-3)10 was noted during smiling with a moderate gingival display, which extended from maxillary right first molar to maxillary left first molar. Measurements such as gingival display, while forced smiling and the upper vermilion lip length were recorded with UNC calibrated probe. There was 6 mm of gingival display on forced smiling. Informed consent was obtained after discussion of the benefits, possible complications, and alternatives to lip repositioning.

### Modified lip repositioning surgery:

Local anaesthesia (Lignocaine 2% with epinephrine 1:80,000) was injected at the vestibular mucosa and lip from the maxillary right to left first molar. With the help of an explorer, bleeding points were induced at the mucogingival junction, which guided the first incision made at the mucogingival junction from the mesial line angle of the right

central incisor to the distal line angle of the right second premolar [Figure 4]. A second incision that run parallel to the first incision and 10–12 mm apical to the mucogingival junction was made in the labial mucosa. The incisions were connected at the central incisor region without involving the maxillary labial frenum [Figure 5]. The epithelium was then carefully dissected Within this outline, leaving the underlying connective tissue exposed. The same procedure was carried out on the left side from mesial outline of left central incisor to the distal outline of left second premolar [Figure 8]. Care was taken to avoid damage to any minor salivary glands. The parallel incision lines were approximated with interrupted stabilization sutures (silk 4/0) [Figure 10]. Coe-Pack was then placed to close the wound [Figure 11].

Patient was discharged with all postsurgical instructions and medications for 5 days which included antibiotic (amoxicillin 500 mg 8 hourly for 5 days), analgesic (ibuprofen 400mg 8 hourly for 3 days), proton pump inhibitor (pantoprazole 40mg once daily in empty stomach for 5 days) along with cold packs extra orally to decrease postsurgical swelling. Patient was recalled after 10 days for a follow-up. The patient reported with mild pain and tension at the surgical site during the 10 days after surgery. It was seen later that the suture area healed in the form of a scar [Figure 13]. The gingival display measured after 10 days was <1 mm with only interdental papilla being seen after forced smiling giving an aesthetically pleasing appearance. Revaluation was further carried out after 1,3months to see the stability of the results obtained. After a period of 1,3months the patient did not find any tension or pain while smiling [Figure 15].

## DISCUSSION

This case report describes a novel surgical procedure, modified lip repositioning surgery to treat the excessive gingival display during smiling. In 1973, Rubinstein and Kostianovsky<sup>(23)</sup> first did the lip repositioning surgery, later in 1979, Litton and Fournier<sup>(24)</sup> modified this surgery with elevator muscle detachment. Miskinyar<sup>(25)</sup> in 1983, informed no relapse for the 27 patients he treated with myectomy and partial resection of either one or both of the levator labii superioris muscles bilaterally in lip repositioning surgery. Ellenbogen<sup>(26)</sup> in 1984 reported that resection of levator labii superioris is short lived, with gummy smile returning within 6 months. He advocated placing a spacer, either nasal cartilage or prosthetic material, between the stumps to prevent the muscles from being reunited and again hyper elevating the lip. Polo et al. in 2005<sup>(27)</sup> used botulinum toxin in patients with hyper functional upper elevator musculature to correct gummy smile. Despite, the limited availability of the studies focused on the outcome of lip repositioning, the systematic review published by Tawfik et al<sup>(28)</sup> showed that lip repositioning successfully improved excessive gingival



Fig-1: Preoperative patient view



Fig-2 : presence of > 5mm attached gingiva



Fig-3 : Area demarcated with indelible pencil (10-12 mm)



Fig-4: Horizontal incision at mucogingival junction



Fig-5: Partial thickness dissection (right side) exposed connective tissue



Fig-6: The strip of epithelium which was removed



Fig-7: Removing epithelium



Fig-8(a) Exposed connective tissue without involving frenum



Fig-8(b): Raw wound area



Fig-9: Removed epithelium



Fig-10 : Multiple interrupted sutures placed



Fig-11 : Coe-Pak given



Fig-12 : 10 days after surgery



Fig-13 : Suture removal after 10 days



Fig-14 : Post-operative view after 1 months



Fig-15 : 3 months after surgery



Fig-16 : Gingival display after 3 months



Fig-17 : 3 months after intra oral view

display by 3.4 mm Therefore , the alteration of excessive gingival display may be an important element, not only in terms of smile aesthetics but also in terms of patients self-esteem. In a study by Ribeiro<sup>(14)</sup> et al. patients reported high satisfaction with their aesthetic appearance both at 7days and at 6 months after surgical correction of a gummy smile. In a similar maner, cario<sup>(13)</sup> et al. reported that patients rated the final outcome of surgical intervention as satisfactory at the 6-months time period .

In the present case after 3 months follow-up this surgery produced stable results with patient good satisfaction value. The positive outcome of this surgery are (1) restrict hyperactive upper lip (2) reduce excessive gingival display.

However, the contraindications of this surgery, are(1) the presence of an inadequate zone of attached gingiva, which can create difficulties in flap design, stabilization and suturing. (2) severe vertical maxillary excess which needs orthodontic treatment or an orthognathic surgery and (3) thin gingival biotype where the chances of relapse are more common. Recurrence rate for this procedure is% influenced by the presence of the gingival biotype, although in this patient it was thick biotype which reduces the possibility of relapse.

## CONCLUSION

Modified lip repositioning procedure is a simple procedure that offers an excellent alternative to other invasive procedures with higher morbidity rates. In this present case, the functional and aesthetic parameters were achieved and the patient was satisfied with the outcome of the procedure.

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