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MODIFIED LIP REPOSITIONING: A BOON FOR GUMMY SMILE: A CASE REPORT

Periodontology

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ABSTRACT

Background: A high lip line often known commonly as gummy smile is seldom a cause for concern for the patient and leads to the desire for its correction. The gummy smile is usually caused by the hyperactive pull of the elevator muscles.
Methods: The procedure used in this case is a modified lip repositioning procedure wherein the labial frenum is left intact in order to maintain the midline.
Result: The results following the surgery one month followed by five months were satisfactory as around 4 mm reduction in the amount of gingiva displayed was observed.
Conclusion: This modified lip repositioning can be used as a non-invasive procedure can be used to reduce the excessive display of gingiva effectively.

KEYWORDS

Gummy smile, Lip repositioning, Aesthetics

INTRODUCTION:

A common cause of patient dissatisfaction in today's appearance conscious world is excessive gingival display. The excessive display of gingiva is usually a result of gingival dominance due to the imbalance in the gingiva to tooth ratio. In lay terms this is known as 'gummy smile'. It is often shown that this excessive display of gingiva can affect the patient's emotional and psychological status[1]. The elements that make up a smile are the lips, teeth and gingival scaffold[2]. The display of gingiva from the lower border of the lips to the margin of the gingiva of the maxillary central incisor is around 1-2 mm. When this distance increases to 4 mm or more it is classified as unattractive[3]. Lips are what form the aesthetic zone and while smiling the lip lines can be generally described as high, medium and low[4].When only a small portion of the teeth are visible beneath the upper lip, the lip line is defined as high, it is medium when around 1-3 mm of the marginal portion of gingiva is exposed while smiling and the case of gummy smile is when approximately 3 mm or more of the gingiva is seen, the lip line is defined as high [2,4].Tian J observed that low lip line was exhibited by 20% of the population, lip line that is medium was presented by 69% and 10.5% showed a high lip line.

The aetiologies that could be associated with excessive display of gingiva are altered passive eruption[5], vertical maxillary excess[2], gingival enlargement, short or hypermobile upper lip[6]. Identification of the aetiology is of prime importance in the formulation of an appropriate treatment plan. Altered passive eruption can be dealt with apically displaced flap or gingivectomy depending upon whether osseous resection is required or not. Orthognathic surgery is the choice when vertical maxillary excess is the reason for the excessive gingival display. This will help in restoring the occlusal relationship and thus reducing the gingival display[7]. However, the surgery requires hospitalization and can thus be daunting for the patient. Therefore, repositioning of the lip can be advocated as an alternative for the treatment of excessive gingival display.

The prime objective of the procedure is the correction of a jarring gummy smile through surgery. The correction is primarily brought about by prohibiting the retraction of the smile muscles i.e., the elevators(orbicularis oris, levatoranguli, zygomaticus minor, and levator labii superioris), that would result in a narrow vestibule and a muscle pull that is restricted, which eventually reduces the display of the gingiva upon smiling[7]. This procedure was described for the first time in plastic surgery literature in 1973 by Rubinstein Am[8].

This case report delves into the modification of the lip repositioning procedure described by Rubinstein and Kostianovsky[8] in the therapy for gummy smile with satisfactory results.

Case History

A 26 years old female patient reported to the Department of Periodontology with the chief complain of displeasure with the amount of gingiva that showed upon smiling. The patient desired a more 'natural' smile with limited gingival display. Upon careful history taking it was revealed that she was healthy systemically and also had no history of any intake of prescribed medication. On clinical examination it is was seen that the excessive gingival display was around 8 mm on smiling and the gingiva was healthy and harmonious and the attached gingiva was sufficient. The crown length of the central incisor was 8mm. During smiling a total 12mm lip rise on smiling was observed (Figure 1). On complete evaluation it was seen that the cause of the excessive gingival display was seen as hyperactive upper lip and it could also be attributed to the insufficient length of the central incisors. Therefore, a repositioning procedure of the lip which was modified from Rosenblatt and Simon[7] was planned as a treatment for the excessive display of gingiva i.e., the gummy smile.

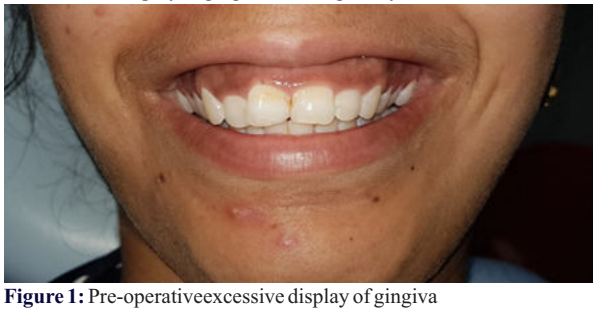

Figure 1: Pre-operativeexcessive display of gingiva

The patient was asked to rinse with 0.2% Chlorhexidine for a minute. Infraorbital nerve block was given bilaterally using 2% Lignocaine with 1:200,000 adrenaline. About 1.8 ml was injected on each side.

The surgical procedure was initiated by first marking two lines at a

distance of 12 mm. The first line is drawn 1mm coronal to the mucogingival junction, 12mm from this point the second horizontal line is drawn using an indelible pencil. The two horizontal lines are connected using two vertical lines at the end of the horizontal lines which extend till the mesial line angle of the first molars on either side (Figure 2). Once the markings are completed, a partial thickness incision is given following the markings removing the epithelium and the connective tissue is exposed. The labial frenum is left intact and the tissue is removed from either side of the frenum in order to maintain the midline (Figure 3). Minor salivary glands are removed wherever necessary. Continuous interlocking sutures using 4-0 black silk suture was given to make the mucosa to the gingiva stable (Figure 4).

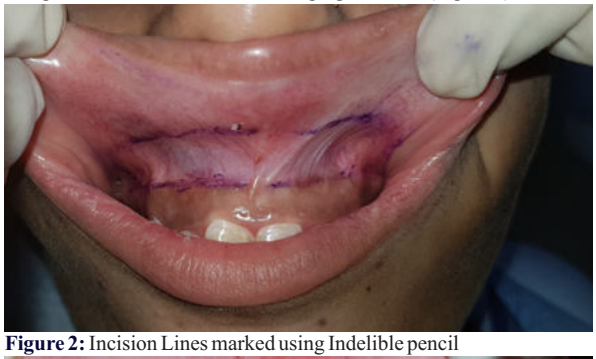

Figure 2: Incision Lines marked using Indelible pencil

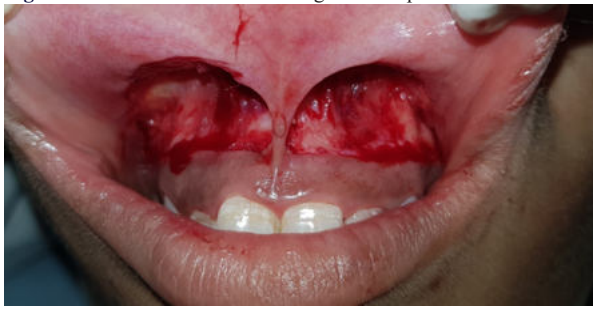

Figure 3: Intraoperative picture displaying the removal of epithelium and connective tissue

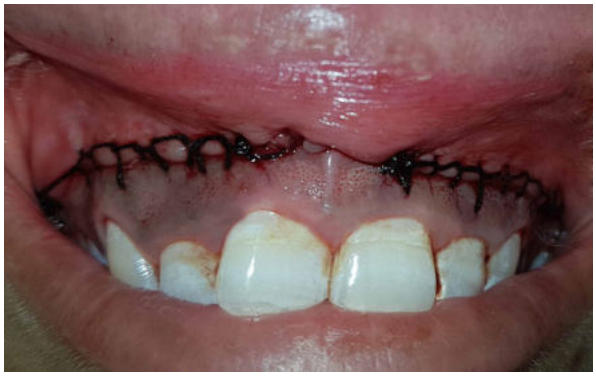

Figure 4: Continuous interlocking sutures placed to close the incision line

Post-operative instructions given to the patient included twice daily rinse with 0.2% Chlorhexidine for the period of 15 days. The patient was prescribed analgesics (Ibuprofen 400 mg) and antibiotics (Amoxycillin 500 mg TDS) for a period of 5 days. The patient was asked to use an ice pack and soft diet was recommended for the first week post surgery, limited movement of the lips (smiling and talking) for about 2 weeks and avoidance of any mechanical trauma to the surgical site.

The patient was asked to turn up for a follow up visit after 1 week and sutures were removed 2 weeks after the surgery. The patient was further asked to come for another follow up after another 2 weeks and then at 1 month followed by 5 months.

The patient reported with peri-oral swelling during the first week following the surgery but it resolved completely when the patient reported for suture removal 2 weeks post surgery. Other than the swelling the healing post operatively was uneventful and the patient just experienced tension while talking and smiling 2 weeks after the surgery. An inconsequential scar was seen on the suture line which was not seen upon smiling.

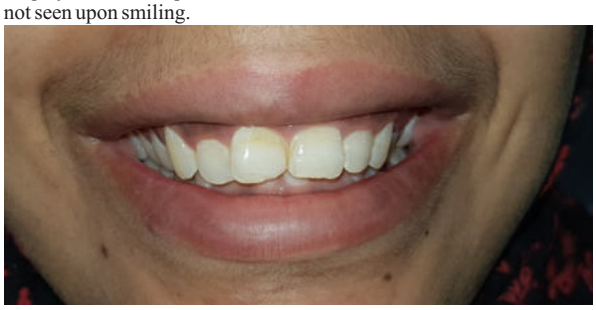

Figure 5: Follow up after 5 months.

The 6-month follow up showed a significant reduction in the gingival display on smiling (Figure 5). Only about 2-3 mm was gingiva was seen on smiling. The patient was satisfied with the final result and found her smile to be more natural.

DISCUSSION

The focus of the present case study is assessment of the modified technique of the lip repositioning procedure in the treatment of surplus display of gingiva due to hyperactivity of elevator muscle of the upper lip.

The technique discussed in this case report is modified from the technique described by Rubenstein and Kotianovosky[8] as well as by Rosenblatt and Simon[7]. The amount of tissue that was removed was around 10-12mm as suggested by various other authors[7,9]. But the extent to which the reduction in the lip movement is not very predictable but can vary from one case to another. The above-mentioned case showed a reduction in lip movement by about 6 mm. A similar result was reported by Rosenblatt and Simon[7]. The association between the extent of tissue resected and the amount of reduction in the gingival display has not been established yet and is still a matter discussion.

Cause of concern for surgeon should be the reason for the excessive gingival display. The cause should be determined with certainty prior to the treatment plan. Excessive gingival display can occur due to a number of causes like increased vertical maxillary excess, altered passive eruption of teeth, hyperactive upper lip muscles, short upper lip length. Vertical maxillary excess can be determined by the proportions of the face when divided into three horizontal thirds, and the inferior third has the maximum proportions[10]. The lip length when determined if less than 20- 24 mm will be considered as short lip length[11]. Typical to a case of altered passive eruption the distance from the CEJ to the gingival margin is greater than 1.5 mm, then gingivectomy should be considered as the treatment option[12]as this distance indicates that the tooth is covered with excess gingiva. The tooth length to width ratio should also to be taken into consideration. Crown length when 80% to crown width is considered as the "gold standard" and the average range is considered from 65%-80% for maxillary central incisors and about 70% for maxillary lateral incisors. The patient treated in this case report had hyperactive upper lip elevator muscles with the crown length-width ratio around 72.52% for maxillary central incisors and around 70% for maxillary lateral incisors. Thus, the treatment option considered suitable for this patient was the modified lip repositioning procedure. The labial frenum was decided to be preserved during the surgery in order to ensure maintenance of the midline and also to reduce the patient morbidity.

Other documented procedures for the therapy of excessive gingival display are myectomy and partial lip muscle removal, detachment procedures, etc., however, lip repositioning procedure is a technique that is relatively less invasive and has limited patient morbidity, it can be explored for treatment of gingival display only when the case meets the required criteria.

However, longer follow up periods and studies with larger study sample sizes need to be conducted in order to determine the appropriate viability of the modified technique of the lip repositioning procedure.

It can thus be concluded that the modified technique of lip

repositioning can be used for the treatment of gummy smile providing the patient with the mental satisfaction that she was seeking. The modified technique can prove to be useful as it helps to maintain the midline of the patient. Thus, this technique can used in the future as a dependable technique to repair a gummy smile.

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