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MODIFIED LIP REPOSITIONING; A SURGICAL APPROACH IN MANAGEMENT OF GUMMY SMILE: A CASE REPORT

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ABSTRACT

Excessive gingival display while smiling not only manifests as an esthetic challenge, but it also hampers the confidence of an individual. Lip repositioning surgery focuses on management of such challenges in a much conservative and less invasive manner, as compared to other major surgical procedures. This case report is drafted with an objective to demonstrate the efficacy of lip repositioning surgery in a case of excessive gingival display with much satisfactory results and up to par gingival coverage. The technique used in this particular case is the modified lip repositioning to give a noteworthy esthetic smile.

Keywords: Excessive gingival display, Gummy smile, Perio-esthetics, Modified lip repositioning surgery

INTRODUCTION

Dentistry is currently transcending more into an epoch of esthetics. Cosmetic dentistry is playing a vital role in delivering the "smile of their dreams" to every individual who desires it. A very common issue that bothers individuals these days is a "gummy smile", leading some to a feeling of embarrassment and others to a negative impact on their social life. A smile is an important gestural method of communication and is an

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interaction between the teeth, the lip framework, and the gingival scaffold. [1] Gummy smile may be due to an imbalance in the relationship between the proportion of gingival tissue and teeth. An aesthetic judgement can be made by viewing the patient from the front in dynamic stages like while making conversations, facial expressions and smiling.[2] Normal gingival display between the inferior border of the upper lip and the gingival margin of the maxillary central incisors during a normal smile is 1–2 mm. [3] At least 50% of the patients exhibits some form of gingival display in a normal smile. However, exaggerated or forced smile patterns display gingiva in up to 76% of all patients. [4] A gingival display is considered perfect on normal smiling if it is in the range of 1-2 mm as measured from the inferior border of the upper lip and the gingival margin of the maxillary central incisors. If this distance is anything around 4 mm or beyond, it is regarded as unesthetic or rather unattractive by people otherwise. A gummy smile may not always be related to any underlying pathologies; however, it definitely affects the psychological behaviour of an individual.

Causes of gummy smile include: [5,6]

a. vertical maxillary excess
b. anterior dentoalveolar extrusion
c. altered passive eruption
d. short or hyperactive upper lip.

Indications:

a. Moderate gingival display that is not skeletal in origin and vertical maxillary excess that ranges between 4 and 8 mm. This limits the action of the retraction muscles such as zygomaticus minor, orbicularis oris, levator anguli oris and levator labi oris.

Contraindications:

a. Presence of minimal zone of attached gingiva
b. Several vertical maxillary excesses (VME)

Degree II VME has gingival and mucosal display of 4 to 8 mm. In the other hand, in degree III VME more than 8 mm of soft tissue are seen. In both cases, an interdisciplinary approach is required. [7]

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This case report describes the modified lip repositioning procedure and its outcome in the treatment of excessive gingival display.

Case Report:

A 22-year-old male patient reported to the Department of Periodontics and Oral Implantology, D. Y Patil Deemed to be University, School of Dentistry, with a chief complaint of gummy smile, due to excessive gingival display. The patient did not report any relevant medical history that would contradict the surgical procedure.

On extra-oral examination, the patient exhibited a bilaterally symmetrical and oval facial profile along with a high lip line that was prominent while smiling.

On intra-oral examination, the teeth seemed to be normal in shape, height and width. However, while smiling, excessive gingival display, average 6 mm, was noted from the maxillary right second premolar to the maxillary left second premolar (**Fig 1**). The excess gingival display presented as unesthetic smile. Various treatment options were discussed with the patient, and Modified Lip Repositioning Surgery was deemed to be a superlative option considering the risk and benefit weightage.

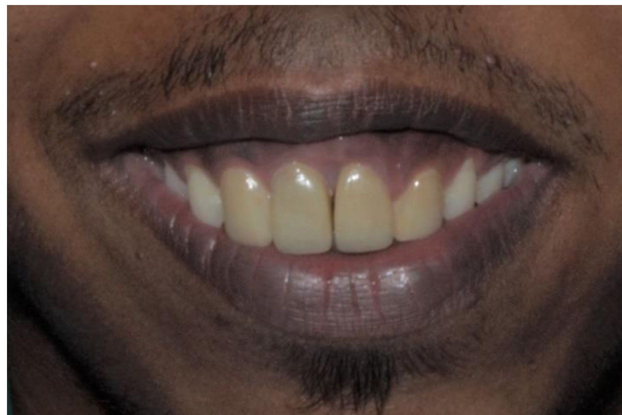

Fig 1: Patient smile wherein excessive gingival display of average 6 mm is seen.

Objective of the procedure:

The prime goal of the surgery was to minimize the gingival display during smiling, and enhance the patient's smile.

Patient preparation:

The patient was explained all the possible complications and risks of the procedure and a written informed consent was obtained prior to the surgical procedure. The required

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blood investigations (Haemoglobin level, bleeding time, clotting time and random blood sugar) were carried out prior to the surgery, in order to avoid any unwanted complication intra/post-surgery.

Surgical Procedure:

The procedure was initiated after administering local anaesthesia (2% lignocaine with 1:80,000 adrenaline) in the maxillary labial vestibule, extending from maxillary right second premolar to the maxillary left second premolar. The surgical site was marked with contrast pencil **(Fig 2).**

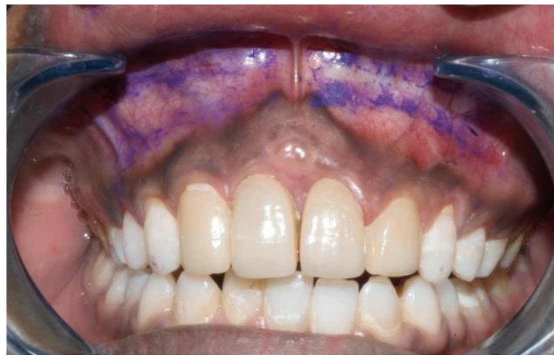

Fig 2: Surgical site marked with a contrast pencil.

A partial thickness incision was made at the mucogingival junction extending from distal line angle of the maxillary right second premolar to the mesial line angle of the maxillary right central incisor, and distal line angle of the maxillary left second premolar to the mesial line angle of the maxillary left central incisor. A second partial thickness incision was made 8 mm apical and parallel to the first incision. Both the parallel were connected at the mesial and distal extremity of the marking, sparing the maxillary labial frenum, to create two separate quadrilateral shaped incisions **(Fig 3)**.

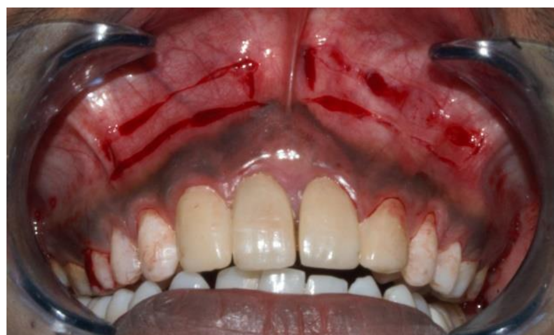

Fig 3: Bilateral incisions showing two separate quadrilaterals, with unscathed maxillary labial frenum.

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Both strips of the maxillary labial epithelium were removed after precise and cautious dissection, leaving behind the connective tissue **(Fig 4).** The parallel incisions were then carefully approximated and sutured without any excess stress on the tissue and adequate stabilization was ensured **(Fig 5).** Suturing was done using vicryl 5-0 sutures.

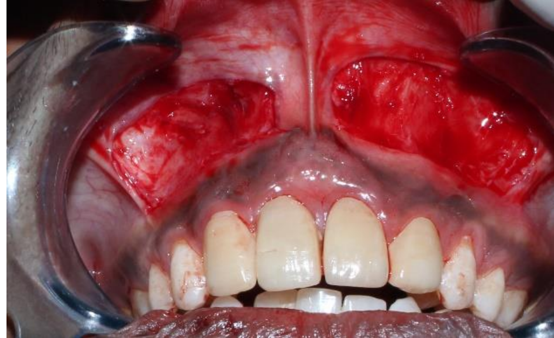

Fig 4: Exposed bilateral connective tissue

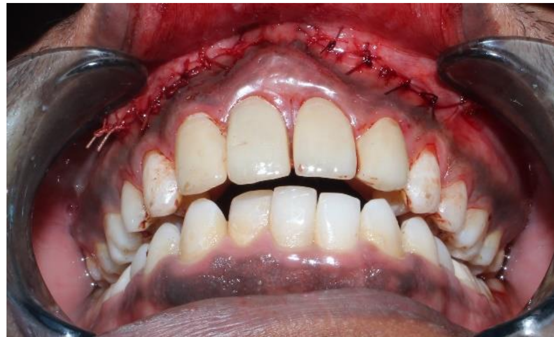

Fig 5: Suturing, with adequate approximation and stabilization of the incision.

Prior to discharge, post-surgical instructions (ice pack application, minimizing lip movements)were given to the patient and was prescribed non-steroidal anti-inflammatory drugs (Diclofenac sodium 50 mg thrice daily) and oral antibiotics (Amoxicillin 500 mg twice daily) for 5 days. The patient was recalled after a week for evaluation of healing.

In the subsequent follow up visit, the patient did not report any complications or extreme discomfort during the healing period; except for some mild discomfort while talking and smiling. The healing was satisfactory during the 1 week follow up visit **(Fig 6).**

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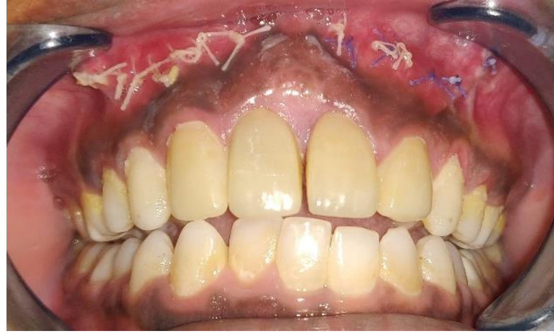

Fig 6: Satisfactory healing after 1 week

The patient was thereafter re-called for subsequent follow up visits at 1 month, 2 months and 3 months interval. The patient was contended with the results.The gingival display reduced exorbitantly from an average baseline of 6 mm to 3 months average of 2 mm **(Fig 7**).

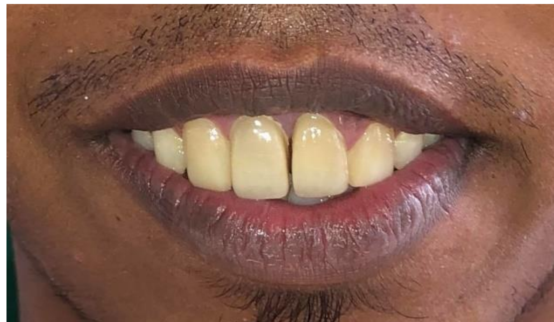

Fig 7: 3 months follow up

DISCUSSION

This case report discusses a contemporary technique to treat a gummy smile. This procedure is different from the conventional lip repositioning surgery which was first reported in the medical literature in 1973 by Rubinstein and Kostianovsky. [8] In 1979, Litton and Fournier described gummy smile correction with lip repositioning surgery, including elevator muscle detachment in cases with a short upper lip. In 2010, Ishida et al. [9] reported a significant reduction in gingival exposure in 14 patients treated with levator labii superioris myotomy, subperiosteal dissection, and frenectomy. The modified technique executed in this case, the maxillary labial frenum was preserved, and two mucosal strips i.e. one on either sides of the maxillary labial frenum was removed. This modification was introduced for cases where excessive gingival display at the maxillary labial frenum region were minimal and this modification also aids in maintaining the labial midline and prevents changes in lip symmetry therefore reduces

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postoperative morbidity. A systematic review published by Tawfik et al. showed that lip repositioning successfully improved EGD by 3.4 mm. [10] This suggests that lip repositioning is a successful treatment modality for EGD, especially in patients with minor discrepancies, who are more inclined to a lesser invasive alternative to orthognathic surgery and a more immediate and enduring result when compared with orthodontics and Botox treatment.

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