IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 24, Issue 10 Ser. 2 (October. 2025), PP 26-29
www.iosrjournals.org

Lip Repositioning Surgery: A Minimally Invasive Solution For Gummy Smiles – Case Series

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Abstract:
Background*: Excessive gingival display, commonly known as a "gummy smile," is a significant esthetic concern that can have psychosocial implications, particularly among young women. The etiology may involve altered passive eruption, vertical maxillary excess, a short upper lip, or hypermobility of the upper lip. Various treatment modalities—ranging from botulinum toxin injections and esthetic crown lengthening to orthognathic surgery—have been employed, each with its own advantages and limitations. Lip repositioning surgery has recently emerged as a minimally invasive and predictable alternative that reduces gingival display by limiting the pull of the elevator muscles of the upper lip.*
Materials and Methods*: This case series presents three patients exhibiting excessive gingival display primarily due to altered passive eruption and upper lip hyperactivity. All patients underwent lip repositioning surgery, with or without adjunctive procedures such as esthetic crown lengthening, frenectomy, and gingival depigmentation. The surgical approach involved partial-thickness flap elevation and excision of a strip of mucosa from the maxillary vestibule, followed by coronal advancement and suturing of the lip mucosa to restrict elevator muscle activity.*
Results: *All three patients exhibited a marked reduction in gingival display, decreasing from approximately 5–6 mm preoperatively to 2–3 mm postoperatively. Healing was uneventful, and all patients reported high levels of esthetic satisfaction and improved smile harmony.*
Conclusion*: Lip repositioning surgery is an effective, minimally invasive treatment modality for managing gummy smiles of soft-tissue origin. Successful outcomes depend on careful case selection, precise surgical execution, and adherence to postoperative instructions*
Key Word: *Gummy smile; Excessive gingival display; Lip repositioning surgery; Esthetic dentistry; Minimally invasive technique; Crown lengthening; Depigmentation; Soft tissue management.*

Date of Submission: 28-09-2025 Date of Acceptance: 08-10-2025

I. Introduction

Esthetics has become key focus in modern dentistry. An attractive smile depends not only on the alignment, colour and shape of teeth but also on the harmony between the gingival tissues and dentition. "White esthetics" refers to the natural dentition or restoration of dental hard tissues, while "pink esthetics" refers to the surrounding soft tissues, particularly gingiva and interdental papilla, which enhance or diminish the overall appearance.[1]

During smiling, the gingival display is measured from the lower border of the upper lip to the gingival margin. Gingival display of 1–2 mm is considered ideal, whereas exposure of more than 3 mm is termed gummy smile, often perceived as unaesthetic. [1–3] This is more prevalent in women, with an incidence of 10–29% globally. [4]

The etiology is multifactorial and includes anterior dentoalveolar extrusion, bimaxillary protrusion, vertical maxillary excess, short upper lip, hypermobility of upper lip, and altered passive eruption. [5,8] Proper diagnosis of the underlying cause is essential for successful treatment planning.

Treatment approaches range from minimally invasive to extensive. Botulinum toxin injections provide quick but temporary improvement, typically lasting 3–6 months. [6,9] Esthetic crown lengthening can improve function and appearance but has limited indications depending on biological width. [7,11] Orthognathic surgery corrects skeletal discrepancies but is invasive and associated with significant morbidity. [8]

Lip repositioning surgery has emerged as a minimally invasive, predictable alternative in selected cases. By limiting the upward pull of the upper lip elevator muscles (zygomaticus minor, levator anguli oris, levator labii superioris, orbicularis oris), it reduces the depth of the vestibule and thereby minimizes gingival display. [4,5,10] Adequate attached gingiva is a prerequisite for favorable outcomes. [11]

This case series presents three patients with excessive gingival display primarily due to altered passive eruption and hyperactivity of the upper lip, managed successfully with lip repositioning surgery, with or without adjunctive procedures.

II. Procedure Methodology

CASE 1

A 16-year-old healthy female presented with a chief complaint of excessive gingival display (6 mm) on full smile, which affected her confidence. Extraoral examination revealed a convex profile with an acute nasolabial angle and shallow mentolabial sulcus.

The patient underwent lip repositioning surgery following the technique described by Rosenblatt (2006).[5,10] Incisions were placed along the mucogingival junction (lower) and 12 mm above it (upper), corresponding to twice the gingival display on either side of the labial frenum, which was preserved. The epithelial layer between these incisions was removed, exposing connective tissue[Fig.1]. The first suture was placed bilaterally near the midline to stabilize the flap, followed by suturing the lip mucosa to the mucogingival line creating a shallow vestibule with restricted muscle pull, thereby reducing gingival display during smiling.

At 2 weeks, surgical crown lengthening with depigmentation was carried out in relation to teeth 13–23. At 1-month follow-up, gingival display was reduced to 2 mm and patient reported improved esthetics and self-confidence

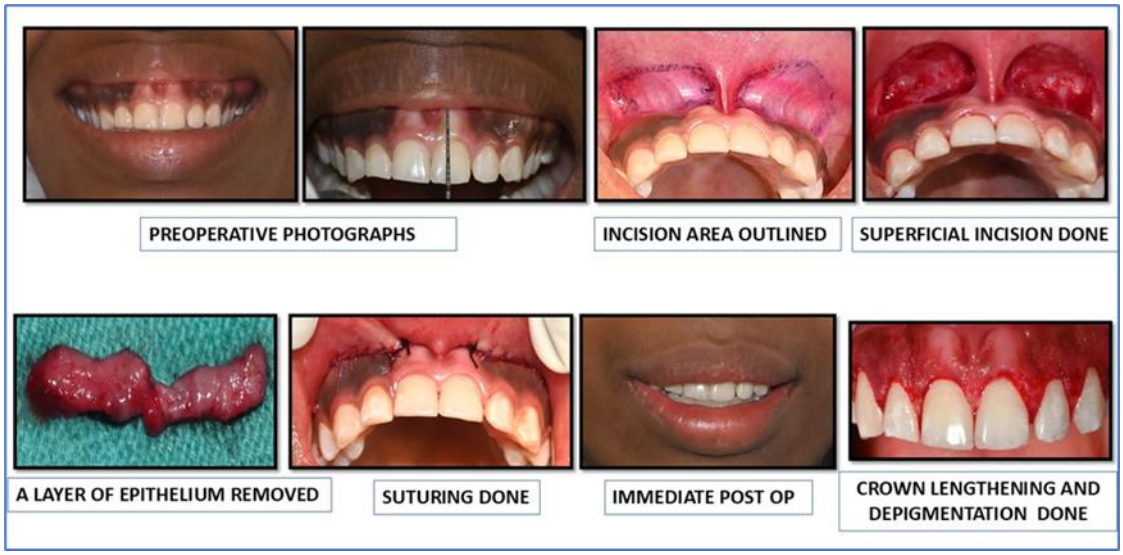

Fig 1 : Preoperative intraoral view

Fig 2: 3 month followup

CASE 2

A 23-year-old female with 5 mm gingival display on smiling sought correction. She was treated with lip repositioning and frenectomy [Fig.3]. Unlike Case 1, crown lengthening and depigmentation were not performed. At 3 months, gingival display was reduced to 2–3 mm, resulting in a balanced and symmetrical smile.

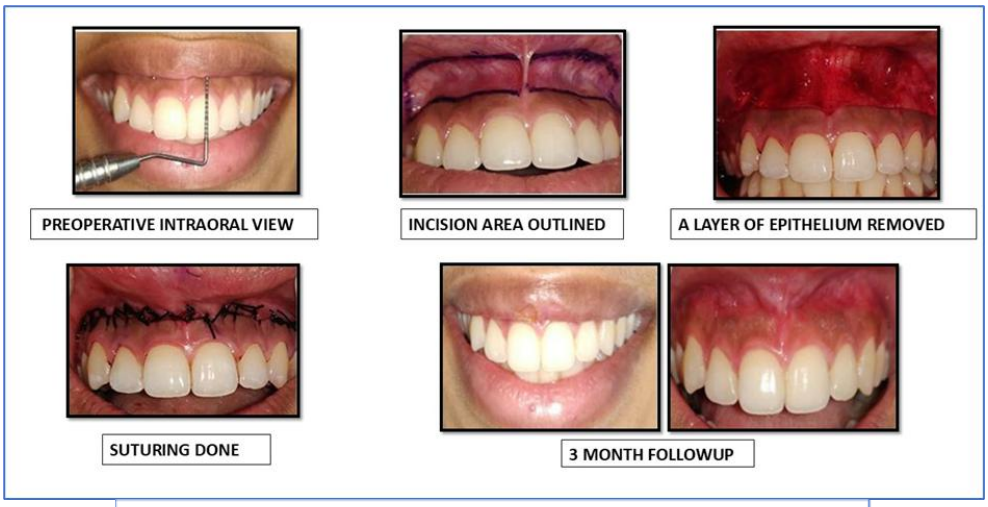

Fig 3 : Preoperative intraoral view and 3 month followup

CASE 3

A 21-year-old female presented with a 5 mm gingival display. She underwent lip repositioning combined with gingival depigmentation [Fig.4]. Postoperatively, gingival display was reduced to 2–3 mm after 3 months, with improved esthetics and patient satisfaction.

Fig 4 : Preoperative intraoral view and 3 month followup

III. Discussion

Excessive gingival display, or gummy smile, is an esthetic challenge that significantly affects psychosocial well-being, particularly in young women. Identifying the exact etiology whether skeletal, dental, or soft tissue related is critical to selecting the most effective treatment.[8]

In the present cases, gummy smile was primarily due to combination of altered passive eruption and hypermobility of upper lip. Altered passive eruption occurs when gingival tissue does not migrate apically to the cementoenamel junction during tooth eruption, leaving excessive gingiva covering the crowns. Lip hyperactivity further accentuates gingival exposure during smiling.[8]

Several treatment modalities exist:

- Orthognathic surgery corrects vertical maxillary excess but is invasive, expensive, and associated with significant morbidity.[8]
- Botulinum toxin injections offer immediate improvement but only last 3–6 months and require repeated administration. [6,9]

- Esthetic crown lengthening reestablishes the dentogingival relationship but may be limited by biological width considerations. [7,11]

Lip repositioning surgery is a simple, minimally invasive alternative that restricts elevator muscle pull by shortening the vestibule. [4,5,10] The technique is flap-free, performed under local anesthesia, and associated with minimal postoperative morbidity. When combined with crown lengthening or depigmentation, as needed, it can produce highly satisfactory results.

An important prerequisite for success is the presence of adequate attached gingiva, which allows proper flap adaptation and prevents relapse.[11] The technique used here followed the protocol of Rosenblatt and Simon, involving partial-thickness dissection and preservation of the frenum when possible. [5,10]

Reported outcomes from the literature indicate favorable short- and medium-term results, with gingival display reduction maintained for months to years. However, long-term stability remains debated, as partial relapse may occur due to reattachment of muscles or inadequate postoperative compliance.[9,11] Careful case selection, precise surgical execution, and patient adherence to postoperative instructions are crucial for maintaining results.

In this case series, all three patients demonstrated a substantial reduction in gingival display (from 5–6 mm to 2–3 mm), resulting in improved esthetics and patient satisfaction. Healing was uneventful, and no significant complications were noted. These outcomes highlight the effectiveness of lip repositioning as a treatment modality for gummy smiles associated with soft-tissue and muscle hyperactivity.

IV. Conclusion

Lip repositioning surgery is a minimally invasive, effective, and esthetically satisfying treatment for patients with excessive gingival display due to soft-tissue causes. When combined with adjunctive procedures such as crown lengthening or depigmentation, the results can be further enhanced. Careful diagnosis, case selection, and adequate postoperative care are essential to achieving predictable and stable outcomes.

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