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Evaluation of the esthetic concern due to altered passive eruption treatment by periodontal surgical approach: A case series

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Abstract
With the increased emphasis on facial esthetics, both patients and dentists are developing a greater awareness of the impact of the gingiva on the beauty of the smile. The aim of the study is to evaluate effectiveness of flap surgery and osseous resective surgery to improve esthetics in patients with altered passive eruption at upper anterior teeth. 5 patients of age range between 20-45 years with altered passive eruption at upper anterior teeth were selected for the study. At baseline mean clinical crown length for central incisor, lateral incisor and canine was (7 ± 0.54) mm (6.6±0.54) mm (7.6±0) mm respectively whereas at 6 months post-operatively it was (9.2 ± 0.54) mm, (7.6± 0.89) and (9.6±0.54) mm respectively. The mean gain of clinical crown length for central incisor, lateral incisor and canine was (2.2 ±1.67) mm, (1.6±0.70) mm and (2 ± 0.54) mm. From the present case series it can be implied that the overall procedure was effective to obtain stable apical shift of the gingival margin position in treating gummy smile.

Keywords: Gummy smile, altered passive eruption, delayed eruption, gingival display, esthetics

1. Introduction
With the increased emphasis on facial esthetics, both patients and dentists are developing a greater awareness of the impact of the gingiva on the beauty of the smile. In recent years, more attention has been given to the problem of excessive gingival display. Excessive gingival display is a condition characterized by excessive exposure of the maxillary gingiva during smiling, commonly called a “gummy smile”. One of the most commonly overlooked etiology of the short clinical crown is altered passive eruption. Goldman and Cohen (1968) [1] termed the failure of the tissue to adequately recede to a level apical to the cervical convexity of the crown as "altered passive eruption." Volcansky and Cleaton-Jones (1974) [2] described the tissue's failure to reach the CEJ junction as "delayed passive eruption. The prevalence of altered passive eruption is reported to be 12%. Therefore the aim of the study is to evaluate effectiveness of flap surgery and osseous resective surgery to improve esthetics in patients with altered passive eruption at upper anterior teeth.

2. Method and Materials
5 patients of age range between 20-45 years with altered passive eruption at upper anterior teeth, probing depth less than 3 mm, width of keratinized gingiva ≥ 3 mm, aesthetic request due to type I. However patients with malposition teeth and teeth with altered crown morphology were excluded from the study.

3. Clinical Measurements
The clinical measurements recorded were Clinical crown length (Distance from the gingival margin to incisal edge) and length of the anatomical crown on radiograph (from CEJ to incisal edge).

4. Surgical Procedure
Prior to the surgical procedure, the patients were instructed to rinse with 0.2 % Chlorhexidine gluconate for one minute. The surgical protocol emphasized complete asepsis and infection control.

After induction of local Anaesthesia (2% Lidocaine, epinephrine 1: 100,000) and identification of CEJ level the following surgical steps were performed. Following the local anesthesia, a submarginal incision, approximately 0.5mm coronal to the calculated CEJ level, was performed at each treated tooth using a 15C blade. Only the buccal site was involved. Care was taken to completely maintain interproximal papillae in situ. The secondary flap was then removed after intrasulcular incisions using a sharp curette. A full thickness flap was then elevated using a small periosteal elevator. Bone exposure was limited to 4-5 mm. As a rule the flap was elevated until the mucogingival junction. When the distance between bone crest and CEJ was <1 mm, a gentle osseous resection was accomplished to create a scalloped bone profile with at least 1mm of distance to the CEJ. Ideally, the osseous crest will be shaped parallel to the CEJ Osteoplasty was performed when necessary. The exposed root surface was then carefully planned to eliminate any residual inserted fibers at the buccal treated sites only. Care was taken to preserve the attachment apparatus at interproximal site. The flap was then sutured at the pre established level, slightly coronal to the CEJ level, to obtain a primary closure using of interrupted black silk 4-0 sutures after suture, the new length of the clinical crown was assessed as the distance between incisal margin and flap margin after suture.

4.1 Post-operative care

Immediately after surgery, periodontal dressing (Coe-Pak, TM, GC, America Inc, ALSIP, IL, USA) was placed on surgical site. NSAID's Tab. Ibugesic Plus (Ibuprofen 200 mg + Paracetamol 400 mg), t.i.d and systemic antibiotic Cap. Mox (Amoxicillin 500 mg), t.i.d was prescribed for 5 days during post-surgical period. Patients were instructed not to brush the teeth for first 30 days after surgery at the treated sites. All patients were instructed to rinse with 0.2% chlorhexidine gluconate (Hexidine- ICPA) twice daily, for 2 weeks. They were instructed not to disturb the pack and to avoid undue trauma to the treated sites.

5. Results

A total of 5 (3 female and 2 male) The mean age was 20±2 years showing Altered passive eruption in maxillary anterior region were treated in the present study. The Clinical parameters were recorded at baseline and 6 months post surgery as shown in Tables 1.

6. Discussion

Aesthetic dentistry is emerging as one of the most progressive and challenging branch of this field. In recent years, more attention has been given to the problem of excessive gingival display or gummy smile. These patients may be self-conscious of their smile and, as a result, avoid social interaction and suffer the same psychosocial ramifications as many patients with non-intact anterior dentitions or otherwise unattractive smiles.

The present study was undertaken is to evaluate effectiveness of flap surgery and osseous resective surgery to improve esthetics in patients with altered passive eruption at upper anterior teeth. During the 6 months study period, the wound healing was uneventful with no flap dehiscence or lack of primary closure, no gingival recession and no sites with probing depth >3mm was detectable at the treated sites after 6 months. At baseline mean clinical crown length for central incisor, lateral incisor and canine was (7 ± 0.54) mm (6.6±0.54) mm (7.6±0) mm respectively whereas at 6 months post-operatively it was (9.2 ± 0.54) mm, (7.6± 0.89) and (9.6±0.54) mm respectively. The mean gain of clinical crown length for central incisor, lateral incisor and canine was (2.2 ±1.67) mm, (1.6±0.70) mm and (2 ± 0.54) mm.

In the present case series a well-defined surgical procedure to correct gummy smile was performed. Precaution was taken to elevate the flap until mucogingival junction, thus achieving good control of surgical gingival margin and simplifying the suture and flap stabilization. Furthermore, in this study resective osseous surgery as part of periodontal plastic surgery was performed to allow a stable apical shift of the gingival margin. Recreating an adequate biological width is necessary to maintain gingival health and to allow sufficient space between the crown margin and the alveolar crest to prevent an inflammatory lesion from developing with possible attachment loss [3]. Most authors agree that a minimum distance of 3mm is required from the osseous crest to the final margin following a crown lengthening procedure. The 3mm allows for 1mm of supra-crestal connective tissue attachment, 1 mm of junctional epithelium and 1mm of sulcus depth [4]. This implies that the overall procedure was effective to obtain stable apical shift of the gingival margin position in treating gummy smile. Current standards in the average smile suggests locating the gingival contour at cuspid at similar level or slightly apical than at central incisors, while a more coronal gingival contour is suggested for lateral incisors. In the present study care was taken to create 1mm of recession in order to sewerage proper change in the gingival margin position. Final outcomes showed that the used procedure was effective with no residual gingival recession, stable improvement of crown length compared to baseline and upto the satisfaction of the patient. In the present study the position of the gingival margin at 6 months post-surgery was apical to the baseline position but coronal to bone crest.

Table 1: Improvement in length of clinical crown at 6 months post-surgically

Tooth no	At baseline	At 6 months	Gain
13	7.9 ±0.54	9.5 ± 0.54	1.6 ±1
12	6.8 ± 0.53	7.8 ± 0.43	1 ± 0.44
11	7 ±0	8.6 ± 0.44	1.6 ± 0.54
21	7 ± 0.54	9.2 ± 0.54	2.2 ± 1.67
22	6.6 ± 0.54	7.6 ± 0.89	1.6 ± 0.70
23	7.6 ± 0	9.6 ± 0.54	2 ± 0.54

Fig 1: Preoperative view showing excessive gingival display

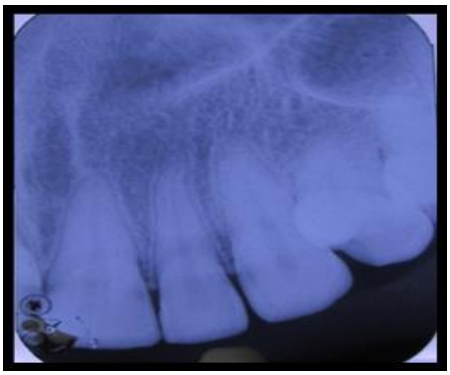

Fig 2: Preoperative Radiograph

Fig 3: Incision placed

Fig 4: Excised tissue

Fig 5: Reflection of the flap

Fig 6: Recontouring of bone

Fig 7: Continuous sling Suture placed

Fig 8: Placement of Pack

Fig 9: Post-operative 6 months after surgery

7. Conclusion

From the present case series it can be implied that the overall procedure was effective to obtain stable apical shift of the gingival margin position in treating gummy smile. However long term, multicenter randomized, controlled clinical trial will be required to know its clinical efficacy and to determine the stability of the results.

8. References

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