Short clinical crowns
: Etiology and treatment considerations in anterior region

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INTRODUCTION

Short clinical crowns may arise from various etiologies, including dental caries, ***altered passive eruption, excessive tooth reduction, attrition,*** exostosis, or inherited variations in tooth morphology. Among the available treatment options, two representative approaches are orthodontic eruption and crown lengthening procedures (*Ashu Sharma et al*.). When crown lengthening is selected, key periodontal considerations include the preservation of biologic width and the presence and adequacy of keratinized gingiva. These factors significantly influence both the surgical approach and technique. This study presents clinical cases of crown lengthening performed in patients with short clinical crowns of varied etiologies. By emphasizing anatomical features and etiologic factors, the goal is to support clinicians in selecting appropriate surgical protocols based on patient-specific assessment.

CASE

Etiology

- **Eruption disharmony** — *Altered passive eruption* → **Case 1** — *Altered passive eruption*
- **Iatrogenic factors** — *Excessive tooth reduction* → **Case 2** — *Excessive tooth reduction*
- **Trauma** — *Attrition* → **Case 3** — *Attrition*

Fig. 1 Clinical view of pre-operation showing altered passive eruption

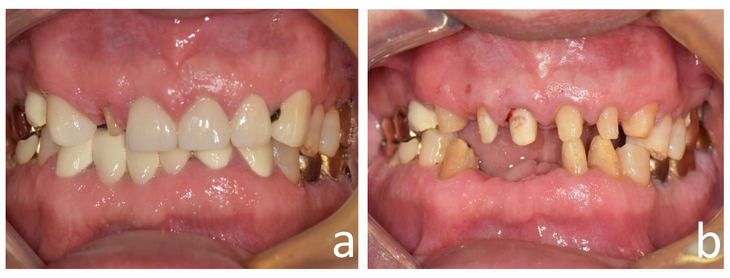

Fig. 2 Clinical view of detachment of #12 prosthesis (a), pre-operation showing excessive teeth reduction(b)

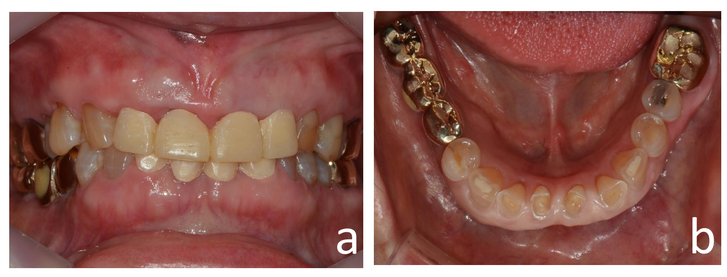

Fig. 3 Clinical view of pre-operation showing attrition on both upper and lower anterior teeth (a, b)

Treatment consideration

Crown lengthening procedure

Biologic width(BW)

- **≥ 3mm** → **Keratinized gingiva(KG)**
  - **≥ 2mm** → Gingivectomy
  - **< 2mm** → Apically positioned flap without osseous reduction
- **< 3mm** → **Keratinized gingiva(KG)**
  - **≥ 2mm** → Flap op(submarginal incision) with osseous reduction
  - **< 2mm** → Apically positioned flap with osseous reduction

BW ≥ 3mm + KG < 2mm
Apically positioned flap without osseous reduction

Fig. 4 Clinical view of excessive gingival display with insufficient keratinized gingiva less than 2mm, biological width more than 3mm when opened flap (a, b), post operation (c)

- F/23
- Presented short clinical crowns primarily due to altered passive eruption on #15-25
- ***Biological width ≥ 3mm***
- ***Keratinized gingiva width < 2mm***
- Therefore, apically positioned flap was performed without osseous reduction

BW < 3mm + KG ≥ 2mm
Flap op(submarginal incision) + Osseous reduction

Fig. 5 Clinical view of excessive tooth reduction and sufficient keratinized gingiva more than 2mm, biological width less than 3mm when opened flap (a, b, c), post operation after rehabilitation of splinted zirconia crowns on #13-23 (d)

- M/67
- Presented short clinical crowns on the restorations, primarily due to excessive teeth reduction on #13-23
- ***Biological width < 3mm***
- ***Keratinized gingiva width ≥ 2mm***
- Therefore, apically positioned flap with osseous reduction was performed
- After crown lengthening procedure, zirconia crowns were delivered, resulting in improved esthetics

BW < 3mm + KG ≥ 2mm
Flap op(submarginal incision) + Osseous reduction

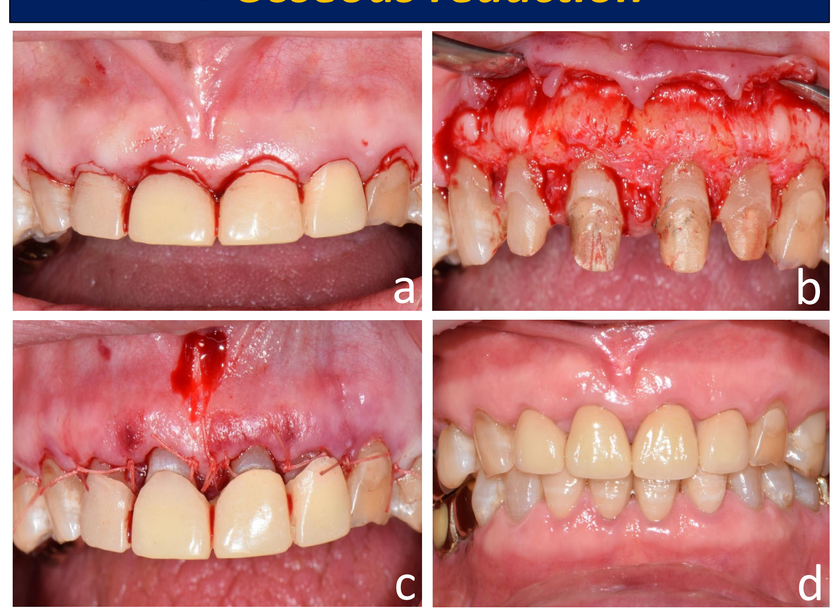

Fig. 6 Clinical view of attrition and sufficient keratinized gingiva more than 2mm, biological width less than 3mm when opened flap (a, b, c), post operation after rehabilitation of zirconia crowns on #12-22 (d)

- F/83
- Presented short clinical crowns on the restorations, primarily due to attrition
- Low vertical dimension also found
- ***Biological width < 3mm***
- ***Keratinized gingiva width ≥ 2mm***
- Therefore, apically positioned flap with osseous reduction was performed
- After crown lengthening procedure, zirconia crowns were delivered

DISCUSSION & CONCLUSION

Among the various treatment options for short clinical crowns, crown lengthening remains one of the most effective and predictable surgical approaches. The selection of technique is primarily guided by two key periodontal considerations: the need to reestablish an adequate biologic width—typically requiring ***≥ 3 mm*** of space from the restorative margin to the alveolar bone crest, which often necessitates osseous resection—and the width of keratinized gingiva. When ***≥ 2 mm*** of keratinized tissue is present, a gingivectomy may suffice; however, if soft tissue is insufficient, an apically positioned flap is generally indicated to ensure mucogingival stability. To achieve optimal clinical outcomes in crown lengthening cases involving various etiologies—including altered passive eruption, excessive tooth reduction, and attrition—the surgical approach must be customized to the patient's specific anatomical characteristics and the underlying cause. Careful diagnostic assessment and etiology-driven treatment planning are essential to maintaining periodontal health, restoring function, and ensuring long-term restorative success.