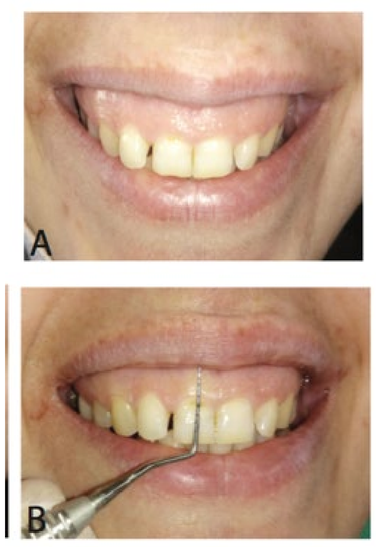
Management of Excessive Gingival Display

Rebecca Matour, DMD
New York Presbyterian Brooklyn Methodist Hospital

INTRODUCTION

Identifying Excessive Maxillary Gingival Display (EGD)

- The maxillary anterior segment is considered to be the critical esthetic zone
- When evaluating esthetics in this region, the gingival labial margin position is central to the achievement of an ideal smile
- Anatomic landmarks determining smile esthetics include positioning of the premaxilla, lips, gingival architecture, and clinical crown
- **Ideal esthetics**: entire maxillary teeth are exposed with 1-3mm gingival show in a full smile
- Gingival display is measured from the inferior border of upper lip vermillion to gingival margin
- ≥ 4 mm display – EGD
- EGD: 10-29% prevalence in general population
- Strong predilection for females



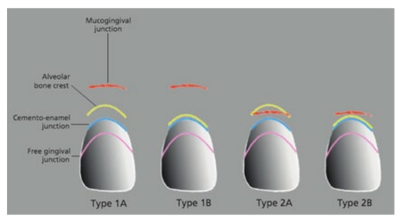
IDENTIFYING ETIOLOGY

Altered Passive Eruption (APE) (*most common*)

- Tooth Eruption Phases

Active Phase: movement of tooth out of alveolar bone into occlusion
Passive Phase: exposure of crown as a result of apical migration of gingival tissue
*In APE, apical migration is incomplete

- Critical component - CEJ relative to FGM within periodontium (should be detectable within gingival sulcus)
- Altered Passive Eruption - CEJ resides up to 10mm apical to FGM
- Classification Scheme (Coslet et al,1977)
  - Type 1 - wide band KT
  - Type 2 - narrow band KT
  - Subgroup A – Alveolar Crest is apical to CEJ
  - Subgroup B – Alveolar Crest approximates CEJ



Hypermobility of Lip

- Upper lip needs to be assessed while patient is in repose positioning and while smiling
- Normal transitional movement of lip: 6-8mm from repose to full smile
- Hypermobile lip is classified when transitional movement is measured: 8-10mm or greater

Vertical Maxillary Excess (VME)

- Cephalometric Analysis is needed to definitively evaluate
- Can evaluate soft tissue proportional thirds (using frontal, lateral views)
- Most cases of VME, patients present as a Skeletal Class II

Lip Length

- Measured by the distance between subnasale and upper lip stomion (Average: 20-20mm)
- Distance less than 20mm denotes a short lip (known as Lip Incompetence)

Dentoalveolar Extrusion

- Evaluation of maxillary anterior segment in three-dimensional space at rest
- Compensatory eruption of maxillary incisors in severe Class II malocclusions

Gingival Hyperplasia

- Requires comprehensive periodontal evaluation: probing depths, CAL, morphological changes in gingival architecture to reach diagnosis
- Medication-induced gingival hyperplasia are most often caused by phenytoin, amlodipine, cyclosporine

Lip Repositioning Procedure

- **Goal**: narrow the vestibule limiting muscle pull, which restricts gingival display during smiling
- **Indications**: mild VME, hypermobile lip
- **Contraindications**: moderate-severe VME, minimal zone of attachment (<3mm)
- Complications: pain, ecchymosis, edema, mucocele formation (severed minor salivary glands), relapse, rare instances of paresthesia and paralysis
- **Twice the Gingiva Display Rule** - remove mucosa equivalent to two times amount of gingival display that needs to be reduced (a maximum of 10-12mm)
- Possible reasons for relapse: inadequate mucosa removal, incision made within zone of KT, pt with high muscle pull (location of muscle attachment)
- Surgical Procedure involves removal of mucosa shortening the vestibule restricting the pull of the elevator muscles
- Mucosa removal can be achieved via: use of scalpel, electrocautery, laser-assisted surgery

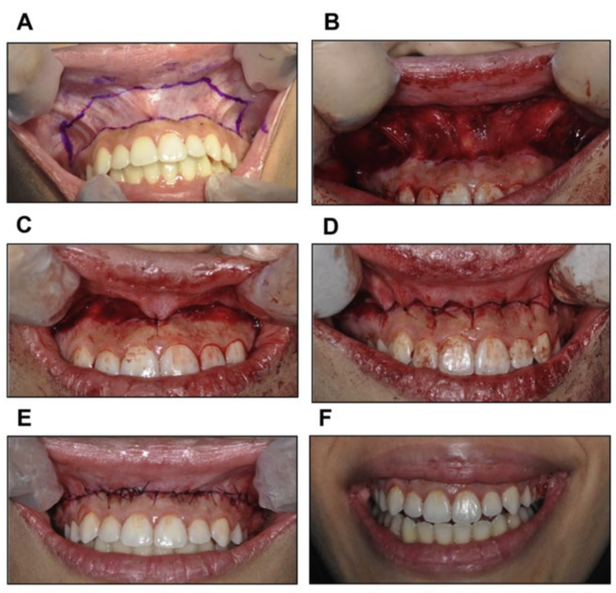


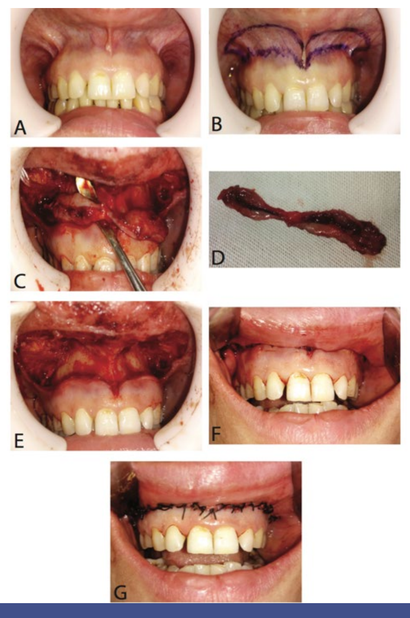
Fig. 2. Surgical steps. (*A*) Incision area outlined according to the "Twice Gingival Display." (*B*) Incision area after superficial incision is finished. (*C*) Midline anchoring suture. (*D*) Remaining anchoring sutures opposite to papillae. (*E*) Both anchoring and stabilizing sutures. (*F*) Immediate postoperative picture. (*From* Foudah M. Lip repositioning: An alternative to invasive surgery a 4 year follow up case report. Saudi Dental Journal. 2019;31:S82; with permission.)

Myotomy Procedure

- **Indications**: mild VME, hypermobile lip
- Surgical Technique

1. Full thickness incision 1mm coronal to MJG at mesial line angles #3,14 (V-shaped to preserve labial frenum)
2. Second full thickness incision made in labial mucosa (parallel and 10-12mm apical to the first)
3. Connect incisions in elliptical shape
4. Epithelium is removed within elliptical
5. Perioral muscle attachments (elevator muscles) are dissected from the bone

- Closure: approximate incisions by suturing muscle layers, mucosa layer is sutured with stabilization sutures ensuring lip midline is coincident with teeth, interrupted sutures to reapproximate flap ends



CROWN LENGTHENING PROCEDURE

- **Indication**: Altered Passive Eruption
- Classification of APE dictates treatment
  - **Type 1A** (thick band KT, BW accommodated) - gingivectomy
  - **Type 1B** (thick band KT, BW violation) - gingivectomy, ostectomy, osteoplasty
  - **Type 2A** (narrow band KT, BW accomodated) - gingivectomy with APF
  - **Type 2B** (narrow band KT, BW violation)- intra-sulcular incision with ostectomy, osteoplasty with APF
- Treatment of 1B, 2B is more complex due to the need to perform resective osseous surgery to provide adequate space for the insertion of the attachment apparatus between newly positioned gingival margin and osseous crest
- Long term complication – free gingival margin rebound
  *Rebound is seen more in patients with thick gingival biotypes

BOTULINUM TOXIN A

- Botulinum Toxin A: "**Botox**"
- **Indication**: hypermobility of lip (elevator muscles are hyperfunctional)
- Derived from Clostridium Botulinum bacteria
- **Mechanism of Action**: inhibits presynaptic acetylcholine release at NMJ resulting in a highly localized paralysis of muscle activity
- Injection Sites
  2mm lateral to alar-facial groove
  4mm lateral to alar-facial groove
  2mm inferior between first two sites
- According to Meta Analysis (Chagas et al, 2018) - treatment outcome is stable through 8 weeks of follow-up
- Gingival exposure does not return to baseline until 12 weeks post-injection follow up
- Requires continuous injections over time to maintain results

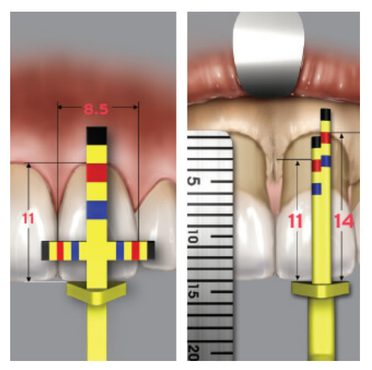
ORTHOGNATHIC SURGERY

- **Goal**: global impaction of the maxilla
- **Indications**: severe VME
- Overdevelopment of alveolar processes (protruding positioning of the premaxilla) and excess anterior vertical height
- Le Fort I impaction and setback to reduce MX height and length addressing excessive gingival display and maxillary prognathism
- Named after Le Fort I Fracture Pattern (extends from nasal septum, along tooth apices, through pterygomaxillary junction)
- Adjunctive Procedures:
  Rhinoplasty (extreme impaction of maxilla compromise esthetics of the nose)
  Bilateral sagittal advancement osteotomy ("Two-Jaw Surgery")
  Genioplasty

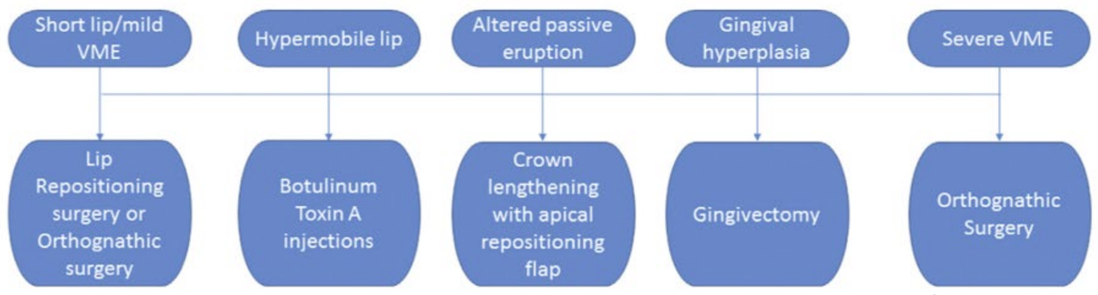
PROSTHODONTIC CONSIDERATIONS

Restoring a patient with maxillary gingival excess

- Incisal edge of the proposed restoration - critical element to treatment planning
- Consider degree of tooth exposure at rest, repose, and laughter
  *Fricative sounds - phonetics and esthetics
- Necessary restorative space determined by material choice
- Use of the Chu Gauge to dictate diagnostic wax-ups, surgical stent, provisional and definitive restorations
- Helps facilitate communication between restorative dentist and surgeon
- Objectively determines amount of hard and soft tissue removal required



CONCLUSION



Dym and Pierre, 2020.

- It is critical that an accurate etiology be identified when managing cases of excessive maxillary gingival display, which will dictate the most predictable treatment modality
- Interdisciplinary treatment is often necessary in order to achieve the best long term clinical outcome

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Presented at the 97th Annual Session of the Greater New York Dental Meeting in 2021