

# ETIOLOGY AND TREATMENT OF GUMMY SMILE: LITERATURE REVIEW

Pereira, D; Fernandes, M; Gonçalves, S; Retto, P; Delgado, A.

Orthodontic Care Consultation, ISCSEM



## Introduction and Objectives

The smile is considered aesthetic when it presents a harmonious relationship between the shape and color of the teeth, as well as a good proportion and framing between the lip and gum. An excessive gingival display during the smile is considered an undesirable aesthetic alteration and often leads patients to orthodontic consultation.

Gummy smile represents an important aesthetic complaint during orthodontic anamnesis and changes the spontaneity of facial expression. A gingival display greater than 2 mm in the smile is classified as a gummy smile. The objective of this work is to identify the etiology, classification and treatments described in the literature of the gummy smile.

## Methods

This literature review was carried in the Pubmed, B-on, Scielo and Science Direct databases, using the combination of the terms "gummy smile", "excessive gingival display" and "lip repositioning surgery". We selected 17 articles published between 1996 and 2017.

## Results

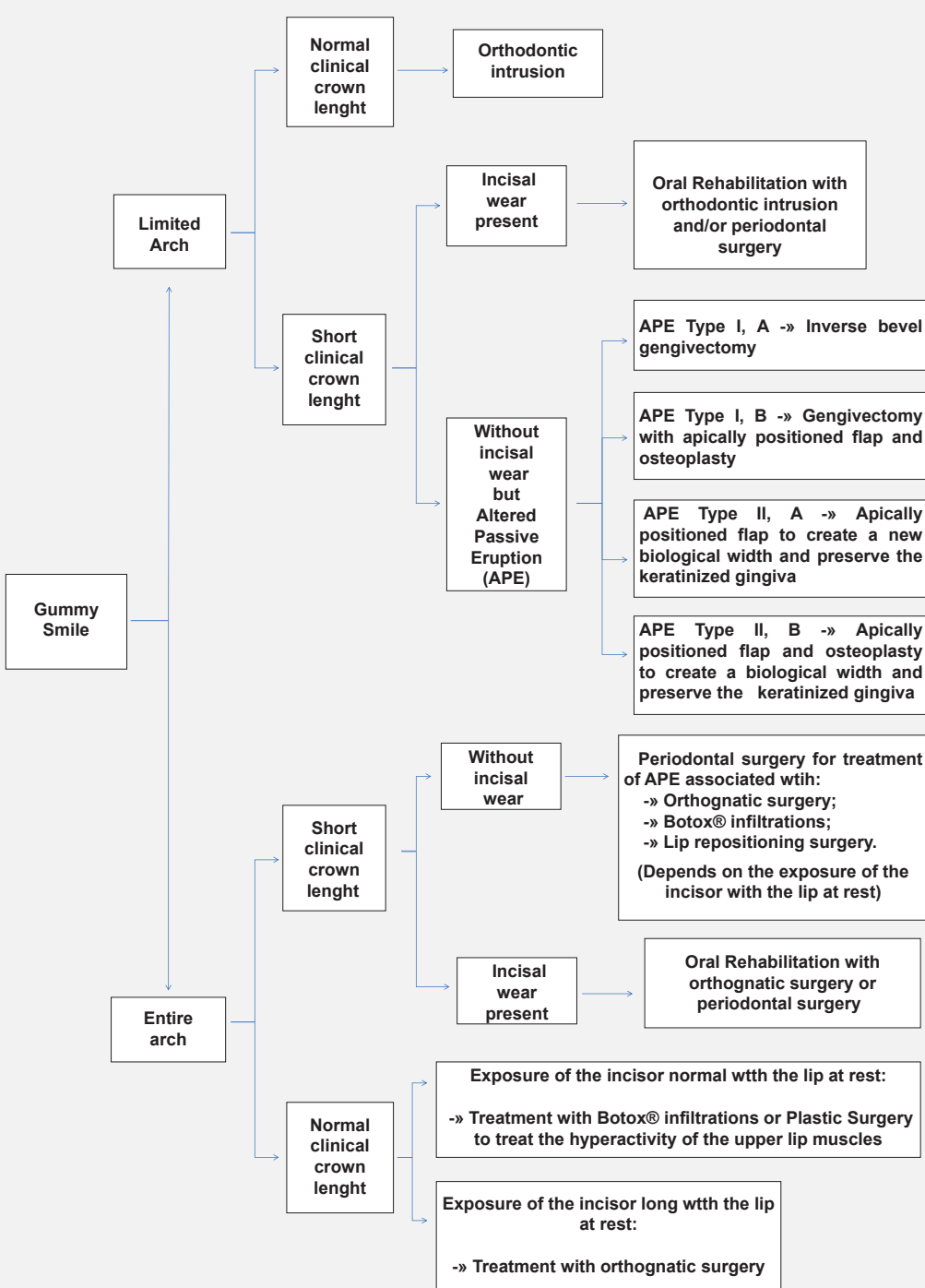


Fig. 1: Representative scheme of the determinants for the correct treatment of the gummy smile.

### Etiological factors:

- Upper dentoalveolar protrusion;
  - Maxillary skeletal vertical excess;
  - Dental extrusion and/or altered passive eruption;
  - Hyperactivity of the upper lip muscles;
  - Infectious and/or drug gingival hypertrophy;
  - Morphofunctional characteristics of the upper lip.
- The gummy smile can be caused by a set of these factors.

Degree	Gingival Display	Treatment Modalities
I	2 to 4 mm	- Orthodontic intrusion; - Orthodontics and periodontal surgery; - Periodontal surgery; - Periodontal surgery and Oral Rehabilitation.
II	4 to 8 mm	- Periodontal surgery and Oral Rehabilitation (the choice depends on the amount of root supported by bone and the root /crown ratio); - Orthognatic surgery; - Lip repositioning surgery, Botox® infiltrations, surgery to release the nasal septum depressor muscle, surgery with reinsertion of the elevator muscle of the upper lip and wing nose are viable alternatives to orthognatic surgery.
III	+ than 8 mm	- Orthognatic surgery and/or periodontal surgery, oral rehabilitation, lip repositioning surgery, surgery to release the nasal septum depressor muscle, surgery with reinsertion of the elevator muscle of the upper lip and wing nose and Botox® infiltrations.

Table 1: Classification of excess gingival display and associated treatment options.

## Conclusions

The study and the careful evaluation of the etiology and degree of gummy smile severity are determinant in the selection of the treatment. The etiology of the gummy smile can be multifactorial, however there are cases in which it is possible to identify an isolated etiological factor.

The patient has the final word in the therapeutic option, so we must explain to the patient clearly all the appropriate treatment options for his case, exposing all the advantages and disadvantages of each therapeutic approach.

## Clinical Implications

A multidisciplinary team, involving Orthodontics, Periodontology, Oral Rehabilitation, Maxillofacial Surgery and Plastic Surgery, is necessary for the diagnosis and treatment of gummy smile, when the etiology is multifactorial.

## References

- 1 - B- Lin C, Wu Y, Chang C and Roberts E. Bimaxillary protrusion and Gummy Smile Corrected with Extractions, Bone Screws and Crown Lengthening. *International Journal of Orthodontics and Implantology* (2014) 35, 40-60.
- 2 - Garber DA and Salama MA. The aesthetic smile: diagnosis and treatment. *Periodontol* 2000 (1996) 11, 18-28.
- 3 - Waldrop TC. Gummy Smiles: The Challenge of Gingival Excess: Prevalence and Guidelines for Clinical Management. *Seminars in Orthodontics* (2008) 14(4), 260-271.
- 4 - Miron H, Calderon S and Allon D. Upper lip changes and gingival exposure on smiling: Vertical dimension analysis. *American Journal of Orthodontics and Dentofacial Orthopedics* (2012) 141(1), 87-93.
- 5 - Seixas MR, Pinto ARC and Araújo TM. Checklist of esthetic aspects to be considered in the diagnosis and treatment of gummy smile. *Dental Press J Orthod* (2011) 16(2), 131-157.
- 6 - Shu R, Huang L and Bai D. Adult Class II Division 1 patient with severe gummy smile treated with temporary anchorage devices. *American Journal of Orthodontics and Dentofacial Orthopedics* (2011) 140(1), 97-105.
- 7 - Nishimura M, Sannohe M, Nagasaka H, Igarashi K and Sugawara J. Nonextraction treatment with temporary skeletal anchorage devices to correct a Class II Division 2 malocclusion with excessive gingival display. *American Journal of Orthodontics and Dentofacial Orthopedics* (2014) 145(1), 85-94.
- 8 - Panduric DG, Blaskovic M, Brozovic J and Susic M. Surgical Treatment of Excessive Gingival Display Using Lip Repositioning Technique and Laser Gengivectomy as an Alternative to Orthognathic Surgery. *J Oral Maxillofac Surg* (2014) 404, 1-11.
- 9 - Grover HS, Gupta A and Luthra S. Lip repositioning surgery: A pioneering technique for perio-esthetics. *Contemp Clin Dent* (2014) 5(1), 142-145.
- 10 - Lack JD. Aesthetic Crown Lengthening: A Step by Step Surgical Guide and Biologic Considerations. *Alpha Omegan* (2009) 102(4), 133-141.
- 11 - Falconer DS and Waite PD. Surgical Management of Skeletal Vertical Facial Problems. *Seminars in Orthodontics* (2013) 19(4), 293-304.
- 12 - Polo M. Botulinum toxin type A (Botox) for the neuromuscular correction of excessive gingival display on smiling (gummy smile). *American Journal of Orthodontics and Dentofacial Orthopedics* (2008) 133(2), 195-203.
- 13 - Sheth T, Shah S and Shah E. Lip reposition surgery: A new call in periodontics. *Contemp Clin Dent* (2013) 4(3), 378-381.
- 14 - Freitas RS, Pessoa TJJ, Tolazzi ARDO and Postai G. Release of the nasal septum depressor muscle for treatment of gingivous smile. *Rev Soc Bras Cir Craniomaxilofac* (2006) 9(1), 1-5.
- 15 - Wang XD, Zhang JN, Liu DW, Lei FF, Liu WT, Song Y and Zhou YH. Nonsurgical correction using miniscrew-assisted vertical control of a severe high angle with mandibular retrusion and gummy smile in an adult. *Am J Orthod Dentofacial Orthop* (2017) 151(5), 978-988.
- 16 - Ozsoy OP, Ozcirpici AA and Veziroglu F. Miniscrews for upper incisor intrusion. *European Journal of Orthodontics* (2009) 31, 412-416.
- 17 - Martinez HC, Govea YC, Porras SP, Costilla OV, Cardenas HRG and Adam GM. Simplifying the surgical treatment of the gummy smile. *Cir. Plast.Iberolatinoam.* (2011) 37(1), 43-49.