

## ALTERED PASSIVE TOOTH ERUPTION: A CASE SERIES

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### Abstract

Gummy smile constitutes a relatively frequent aesthetic alteration characterized by excessive exhibition of the gums during smiling movements of the upper lip. APE is a factor that frequently contributes to the presence of a gummy or gingival smile, and it can easily be corrected by periodontal surgery. In the present article four cases of the same situation and appropriate treatment were given for each case are presented.

**Keywords:** Gummy smile, altered passive tooth eruption, dentogingival unit, crown lengthening procedure

### Introduction:

Tooth eruption comprises two phases: an active eruption phase in which the movement of the teeth in the direction of the occlusal plane whereas, a passive eruption phase is related by apical migration of the soft tissue covering the crown of the tooth.

### Passive eruption

Gottlieb & Orban in 1933 has coined a term "Passive eruption"<sup>1</sup>. This phase can be subdivided into four phases depending on the location of the dentogingival junction relative to the cemento–enamel junction<sup>2</sup>.

The dentogingival junction may be located on enamel alone, on enamel and cementum or on cementum alone, or both the dentogingival junction and the gingival margin may be apical to the cemento–enamel junction. Only first phase of passive eruption is physiological, whereas other three phases are the result of pathological periodontal destruction.

### Altered passive eruption

Goldman & Cohen defined altered or retarded passive eruption as a situation in which 'the gingival margin in the adult is located incisal to the cervical convexity of the crown and removed from the cemento–enamel junction of the tooth'<sup>3</sup>. Within the literature, the condition is additionally stated as "retarded passive eruption" or "delayed passive eruption"<sup>4</sup>.

Coslet et al. has classified APE based upon the amount of keratinized gingiva (Type I: wide gingiva; Type II: thin gingiva ) and two subtypes according to the position of the bone crest to the cemento–enamel junction. In subtype A, 1.5 – 2 mm is the distance of bone crest to cemento–enamel junction whereas in subtype B, the bone crest lies very close to, or even at the same level as the cemento–enamel line<sup>5</sup>(Fig. 1).

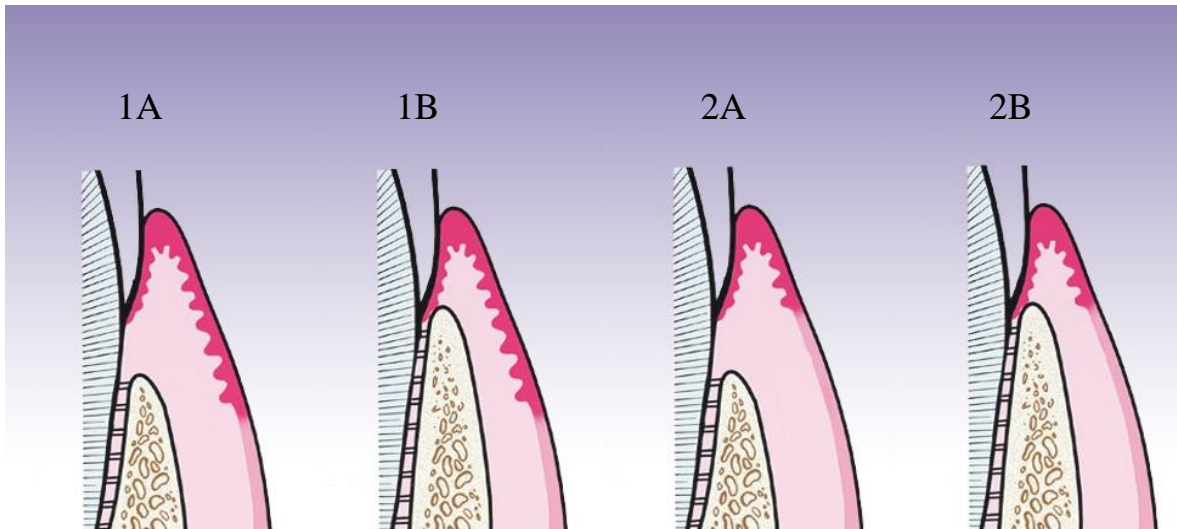


Fig. 1

**CASE I**

18 year old female patient came in the dept. of periodontology with complaint of smaller teeth and gummy smile. On clinical examination and history we came to know that patient had smaller teeth since it erupted in the oral cavity. Patient was systemically healthy and had no history of any medication previously. Patient's hygiene maintenance was quite good and gingival was in good health. On probing, more than 3 mm gingival sulcus were found in almost all

teeth. Gingival was firm and fibrous in nature. By probing, mucogingival junction and alveolar bone crest in consideration we came at conclusion that patient has type 1A type altered passive tooth eruption. (Fig. 2)

Tooth eruption consists of an active and a passive phase. Active eruption is the movement of the teeth in the direction of the occlusal plane, whereas passive eruption is related to the exposure of the teeth by apical migration of the gingiva



Figure 2: Pre-operative clinical view

As treatment guideline given by Coslet, patient was treated by external bevel gingivectomy under local anesthesia in the entire sextant except maxillary left posterior. After gingivectomy teeth look normal in height and patient's gummy smile was corrected satisfactorily. (Fig. 3)

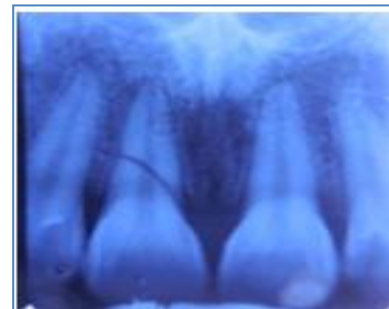


**Figure 3: post operative clinical view**

### **CASE II**

16 year old female patient came with complaint of swollen gums in upper anterior region. Systemically patient was healthy without any history of medication. Clinically patient had plaque and calculus deposition in mandibular anterior region. Gingival sulcus depth in maxillary anterior teeth were 4-5 mm with slight inflammatory component otherwise firm

gingival with fibrous consistency (Fig. 4). Altered passive tooth eruption class 1A was the diagnosis for the condition. (Rad. 1) After thorough supra and subgingival scaling, gingivitis in mandibular anterior teeth gets corrected. External bevel gingivectomy under local anesthesia was performed in maxillary anterior region (Fig. 5).



**Figure 4: Pre-operative clinical view**

**Rad. 1**





**Figure 5: Post-operative clinical view**

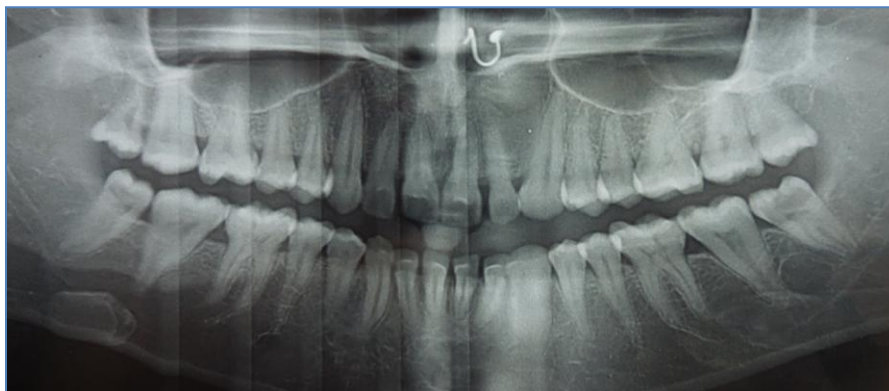
**Case III**

23 year female patient came with complaint of malalignment of teeth. patient had hypothyroidism since early childhood, that's why patient's mental status was abnormal. Earlier patient was diagnosed with schizophrenia. Patient had bimaxillary protrusion and clinical crown heights of anterior teeth were smaller than normal. Width of attached gingival

was more than normal with increased gingival sulcus depth which suggest patient had altered passive tooth eruption (Fig. 6). Altered passive tooth eruption class 1A was the diagnosis for the condition. (Rad. 2) External bevel gingivectomy under local anesthesia was performed in maxillary and mandibular teeth (Fig. 7).



**Figure 6: Pre operative clinical view**



**Rad. 2: Normal alveolar bone to CEJ relationship in affected teeth**



**Figure 7: Post operative clinical view**

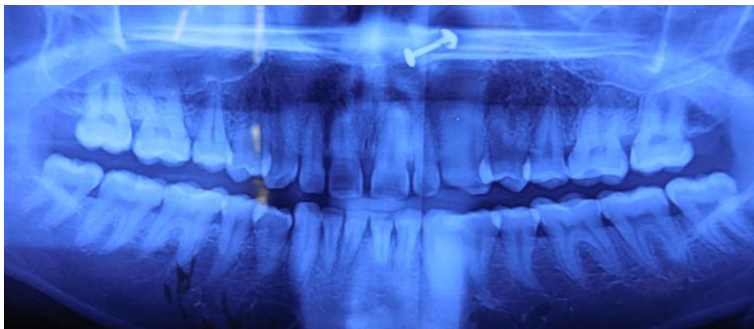
#### **Case IV**

25 year old female patient came in the dept. of Periodontology with complaint of gummy smile. On clinical examination and history we came to know that patient had gummy smile and smaller teeth since it erupted in the oral cavity. Patient was systemically healthy and had not history of any medication previously. Patient's hygiene maintenance was quite good and gingival was in good health. On probing,

more than 3 mm gingival sulcus was found in maxillary anterior teeth. Gingival was firm and fibrous in nature. Width of attached gingiva was quite more than normal. By taking probing, mucogingival junction and alveolar bone crest in consideration we came at conclusion that patient has type 1A type altered passive tooth eruption. (Fig.8 & Rad. 3) External bevel gingivectomy was performed in maxillary anterior teeth region.



**Figure 8: Baseline**



**Rad. 3: Normal alveolar bone to CEJ relationship in affected**

### Discussion

The data about prevalence of APE in the adult population has been little studied to date, possibly because of the lack of clear diagnostic criteria. Volchansky and Cleaton- Jones studied the incidence of APE in 1025 patients with a mean age of  $24.2 \pm 6.2$  years and concluded the incidence of APE was 12.1%<sup>4</sup>. Coslet stated that risk for periodontal health are APE 2A, 1B and especially 2B as a narrow band of gingiva and the absence of connective insertion to the root & should be identified before dental treatment. Volchansky and Cleaton-Jones<sup>4</sup> stated that a deep gingival sulcus favors anaerobes for the development of this infection and found a statistically significant relationship between the presence of APE and acute necrotizing ulcerative gingivitis as Other studies concluded that an excess of gingiva on the tooth interferes oral hygiene and can cause disease especially in individuals who already have a high predisposition to periodontitis.

The greatest clinical relevance of APE may be its esthetic consequences. In effect, dentofacial harmony usually alters when APE affects the upper anterior teeth. The patient usually takes initiative to consult the dental professional for the short and hidden appearance teeth. The relation of the gingival margins to the edge of the upper lip is most important for smile esthetics<sup>6,7</sup>. An analysis of the esthetic alterations produced by APE in the anterosuperior sextant reveals the influence of three factors: (a) The square appearance of the crowns. The gums positioned coronally over the tooth produce a square clinical crown silhouette, when the actual anatomical shape may be ovoid or elliptic, and thus esthetically much more attractive. (b) On smiling, the gums are exposed by the upper lip. When such gum exposure exceeds 2-3 mm, it can produce a poor esthetic effect known as gummy smile. (c) Flattened

gingival festooning leading unaesthetic appearance and abnormal spillway for food particle. In APE, these three factors determine the so-called gummy smile, where in addition to producing excessive gingival exposure, the smile is globally lacking in expressivity.

An analysis of the alterations in esthetic caused by APE in the anterosuperior sextant reveals the influence of three factors.

### Conclusion:

Proper diagnosis of the smile type is crucial for a successful procedure that might increase chances for patients seeking to obtain and expose their “original” smile. It was possible to obtain harmony in the smile through external bevel gingivectomy because it is a less invasive technique and it permits the establishment of an esthetical smile and reduction in case of gummy smile.

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