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Altered passive eruption: A case report

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Abstract

Altered passive eruption is defined as a developmental abnormality in the passive phase of the eruption. It has an aesthetic impact such as the gummy smile and short teeth.

The management of the gingival smile associated with altered passive eruption presents a real challenge for the practitioner, who must know the different signs of this anomaly to make the right diagnosis and to establish an appropriate treatment plan.

The purpose of this article is to expose, the therapeutic modalities of management of altered passive eruption through a clinical case.

Keywords: Gingival overgrowth, altered passive eruption, gummy smile, Gingivectomy

Introduction

Nowadays, the gingival smile has become an frequent reason for consultation in the dental office. It is characterized by an excessive appearance of the gum during the smile. Gingival smile can be the result of many etiologies such as: a short lip; significant vertical maxillary growth; gingival growth and finally altered passive eruption (APE).

Altered passive eruption (APE) is defined as a developmental abnormality in the passive phase of the eruption ^[1]. The classification proposed by Coslet et al. ^[2] is the most frequently cited in the literature. According to which, APE has been divided into two main types. The Type1 is characterized by an excessive amount of attached gingiva, while type2 is associated with a normal gingival dimension. Two possible subclasses were also suggested. In subcategory A, the distance Osseous Crest - CEJ is greater than 1mm, while in subcategory B the bone crest is in the CEJ ^[3].

The management of the gingival smile in connection with the passive eruption, is a real challenge for clinicians, who should make the right diagnosis, to establish an adequate treatment plan and to discuss the various therapeutic possibilities with the patient in order to satisfy his aesthetic demand and avoid recurrence.

In this work we present a case of APE type 1B and then we discuss the means of diagnosis and therapeutic contingencies of different classes of APE.

Observation

A 23-year-old patient in good general health was attended the Department of Periodontology, complaining of a gummy smile. Intraoral examination showed an APE type I subgroup B with the presence of a high keratinized tissue (>5 mm) as well as short teeth. (Figure 2). The probing depth was greater than 4mm at most sites, while a radiographic examination showed that the CEJ was between 0.5 and 1 mm from the bone edge at the 11 and 21 (Figure 3). Treatment involved a gingivectomy following the line of gingival festoons to remove the surplus keratinized tissue. Associated with an osteotomy between the 11 and the 21. One week later the patient had a harmonious and esthetic smile (figure 4, 5, 6). An increase in tooth height was noted, and a reduction in the height of the gingiva exposed during smiling (Figure 8, 9).



Fig 1: Initial smile of patient



Fig 2: Initial clinical situation



Fig 3: Retro-alveolar X-ray showed the distance between CEJ and the bone edge



Fig 4: Gingivectomy



Fig 5: Flap elevation



Fig 6: Bone resection between 11 and 21



Fig 7: Repositioning of the flap and sutures



Fig 8: Final Result (1 year)



Fig 9: Final smile of the patient (1 year)

Discussion

Altered Passive Eruption is characterized by a gingiva that fails to move apically to the CEJ. The result is short and square crowns, which leads to excessive exhibition of the gum, often giving a gingival smile. The frequency in the general population is 12%. APE, apart from its aesthetic consequences, would also according to some authors be a risk-situation for periodontal health [4].

The first step of the diagnosis is to perform an extra-oral exam. This exam includes an assessment of the symmetry and height of the face, the smile line, lip height and mobility. If the gingival smile is due only to insufficient length or hypermobility of the lip, no periodontal treatment will be indicated [3, 5].

In a second step, a periodontal examination is performed (height of gingiva keratinized, probing depth, etc.). APE Type I is characterized by the presence of an excessive attached gums. As for type II, the dimension of attached gingiva is physiologic. The edge of the bony crest is identified by a periodontal probe through the attachment system once the site is anesthetized. For subgroup A, the alveolar ridge is located at 1.5-2mm from the CEJ (physiological location) thus allowing the insertion of the connective tissue fibers of the supra-crestal attachment. When the edge of the alveolar ridge is at the same level of the CEJ, it is subgroup B [3,5].

Zucchelli in 2013 [6], pointed out some difficulties with this approach. In most cases, a single interruption is felt during the sub-gingival probing. It is difficult to distinguish between the CEJ and the bony crest. In addition, even if two sub-gingival interruptions are detected, it may be very difficult to determine whether the distance between them is physiological (1–2 mm) [6].

Radiographic examination helps in the diagnosis of APE. Retroalveolar radiography using the parallel plane technique are most often used to assess the location of the alveolar bone relative to the CEJ and to determine the real height of the crown. If it is greater than the height of the clinical crown, then the possibility of APE should be considered. When the alveolar ridge is less than 1 mm from the CEJ, an APE subgroup B may be suspected. In addition, when X-ray can distinguish two distinct lines, one more coronal for CEJ and another apical for bone crest, diagnosis of subtype A can be made and measurement of CEJ-bone crest distance can be recorded [3].

The use of gutta percha inserted at the sulcus may be of interest in making the diagnosis [3]. This radiograph was obtained using radio-opaque gutta percha inserted into the base of the sulcus and a self-sticking lead plate positioned over the keratinized gingival surface. In this way, the author could correlate the clinical and radiographic diagnoses. It was concluded that a gingival overlap of over 19% of the anatomical crown height is equivalent to the clinical diagnosis of altered passive eruption.

Zucchelli [3] compared the clinical and radiographic lengths of the crown with the object to correct the magnification created in the X-ray image in order to calculate measurements precisely, particularly the distance between the gingival margin and the CEJ and between the CEJ and the bone crest. When a significant difference (≥ 3 mm) is found between clinical crown length (occlusal/incisal edge to gingival margin) and the radiographic crown length (occlusal/incisal edge to cemento–enamel junction), a diagnosis of altered passive eruption is confirmed [3]. (Figure 10).



Fig 10: Periapical radiograph with gutta-percha cone identifying the gingival margin (GM)

Treatment of APE involves periodontal plastic surgery, sometimes prosthetic therapy and in other cases forced orthodontic eruption. In periodontal plastic surgery, Garber et al. [7] suggest two therapeutic options including Gingivectomy

and apically repositioned flap (with or without osteotomy). The Gingivectomy allows a real improvement of the aesthetics. It gives a better visibility of the dental crowns with a harmonious gingival contour and balanced width/length ratio. A minimum of keratinized tissue is preserved after Gingivectomy to ensure periodontal health. This technique is generally indicated in cases of APE type I A. The apically repositioned flap is indicated when the attached gingiva height is insufficient. Bone resection may also be necessary when the alveolar ridge meets with bone or approach to CEJ. The resection is performed to release the supra-crestal attachment essential for periodontal health [7]. (Table 1).

Table 1: Treatment of altered passive eruption

Type of Altered Passive Eruption	Treatment
Type I A	Gingivectomy
Type I B	Gingivectomy + Bone resection (clinical case above)
Type II A	apically repositioned flap
Type II B	apically repositioned flap + Bone resection

Conclusion

The management of the gingival smile associated with APE presents a real challenge for the practitioner, who must know the different signs of this anomaly to make the right diagnosis and to establish an appropriate treatment plan. Clinical examination including: coronary height measurement, attached gum height, bone level, and radiography are the key to diagnosis. Knowledge of the different types of APE is essential for the therapeutic decision.

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