Treatment of supernumerary teeth

Abstract

**Background.** The finding of supernumerary teeth in the oral cavity is a common occurrence, and they are interesting because of their potential to lead to aesthetic and functional alterations. When they are present in the anterior area of the maxilla, they may cause complications, such as late tooth eruption or impaction of the central incisors. They affect from 0.5 to 3.8% of the population, with men being more affected.

**Case reports.** This article describes two cases of impaction of the permanent maxillary left central incisor, due to the presence of a supernumerary tooth in the parasagittal area of the pre-maxilla, as well as the surgical and orthodontic procedures adopted.

**Keywords.** Diastemas; Supernumerary teeth; Supplementary teeth.

Introduction

Supernumerary teeth are considered to be a numerical anomaly, characterised by an excessive number of teeth. Morphologically, they are classified as supplementary and rudimentary teeth [Srivatsan and Aravindha, 2007]. They are usually associated with different syndromes such as Gardner’s syndrome, cleido-cranial dysostosis or with facial fissures. However, they may appear in patients with no pathologies, as an isolated finding. Prevalence ranges between 0.5 to 3.8% in patients with permanent teeth and 0.35 to 0.6% in patients with primary dentition [Fernández et al., 2006; Salcido-Garcia et al., 2004; Van Buggenhout and Bailleul-Forestier, 2008].

This anomaly is usually detected in routine exams, mainly affecting permanent teeth. The majority of these teeth are asymptomatic and 90% of the cases are located in the anterior region of the maxilla [Almeida et al., 1997].

In the maxilla, they most frequently occur in the area of the lateral incisor or as middle teeth, between the two central incisors [Roberts et al., 1997]. They may be supplementary (looking like natural teeth), peg-shaped, tubercular or molar-shaped [Ray et al., 2005], affecting men more than women (2:1) [Bhat, 2006]. According to Bhat [2006] and Cho [2006], supplementary mandibular central incisors are a rarer phenomenon. Salcido-Garcia et al. [2004] studied 2241 radiographs of patients of both sexes. The middle teeth were the most common finding (48.6%), followed by supernumerary molars (26.4%), supernumerary lateral incisors (11.1%) and fourth molars (9.7%). According to the authors, the results point towards the need for a panoramic radiogram of all the patients attended at faculties, clinics and private and public consulting offices to diagnose undetected pathologies.

The study of Fernández Montenegro et al. [2006] assessed a total of 36,057 case records between 1991 and 2003, of which the following factors were reviewed: age, sex, number of supernumerary teeth extracted, location and morphology. Of these, 102 patients had 147 supernumerary teeth extracted. The most frequent were the middle teeth (46.9%), followed by premolars (24.1%) and fourth or distal molars (18%). As regards location, 74.5% of the supernumerary teeth were in the maxilla and 46.9% were in the palatine region. Peg-shaped teeth were the most frequent, and were found in two thirds of the sample. The authors concluded that the middle teeth are the greatest cause of retention of permanent incisors, but they erupted spontaneously after extraction of the supernumerary teeth, if there was sufficient space in the dental arch and if they had eruptive force.

According to the literature, supernumerary teeth may cause functional (malocclusion) and aesthetic alterations (interincisal diastemas), in addition to other complications that may affect the quality of life, among them: impaction of maxillary central incisors, dental retention or late eruption of the permanent incisors, crowding, eruption in the nasal cavity, formation of diastemas, intraoral infection, root anomalies, root resorption of adjacent teeth, formation of cyst accompanied by bone destruction [Cogulu et al., 2008], rotations and pulp necrosis [Giancotti et al., 2008].

Hansen and Kjaer [2004] analysed the radiographic records of 8 children, who presented supernumerary teeth located in the parasagittal region of the premaxilla, and followed them up from the age of 1 year and 5 months through to the age of 11 years and 5 months. The anomalies found were: invagination of permanent teeth, resorption of incisor roots, incisors with curved roots, late eruption, and late formation of roots. The authors concluded that in the region with supernumerary teeth, the adjacent incisors showed late eruption after removal.

Gündüz et al. [2008] studied 23,000 children in Turkey, and verified the presence of non-erupted supernumerary teeth located between the two central incisors, or as a unilateral tooth or bilateral teeth situated in the midline of the maxilla. The majority of the complications found were late eruption of permanent teeth (38.8%), diastemas in the midline of the maxilla (17.6%), axial rotation or inclination of erupted permanent incisors (16.4%), and resorption of adjacent teeth (4.7%). As regards sex, the proportion was 2.1:1 (men and women, respectively). Prevalence of middle teeth in the population was estimated at 0.15% and 2.2%.
Tyrologou et al. [2005] assessed 11,500 children, and of this total, 97 individuals presented 123 middle teeth. In this study, the predominant location was in the palatine region with 39% in an inverted position. The most frequently found alterations were late eruption of the permanent teeth, diastema between the incisors, and change of incisor rotation. No follicular cyst, resorption of middle or adjacent teeth was found. The authors concluded that the risk of complications caused by middle teeth is very small and therefore, a more restrictive attitude with regard to surgical removal could be recommended.

Lo Giudice et al. [2008] emphasised that aesthetics and function are two important parameters to be taken into consideration when treating supernumerary teeth. Particularly, in young patients, invasive and surgical techniques may be replaced by interceptive orthodontic treatments.

Case reports

Case report 1
The child JMS, caucasian, was sent to the authors at the age of 11 years by the orthodontist from the Bucco-Maxillo-Facial Surgery Service of the Secretary of Health of the Municipality of Barueri, SP, Brazil, to remove a supernumerary tooth in the region of tooth 21. Periapical radiographs confirmed the presence of the supernumerary tooth in the region of tooth 21. Periapical radiographs confirmed the presence of the supernumerary tooth superimposed on the image of the tooth 21 (parasagittal position). Planning involved surgical procedure to remove the supernumerary tooth and orthodontic traction of tooth 21.

Surgery was performed by means of a linear incision on the ridge in the region of 21; releasing incision between teeth 22 and 23; interpapillary incision between 11 and 22; divulsion and detachment of the flap; location of supernumerary and tooth 21 (Fig. 1); removal of supernumerary tooth (Fig. 2); bonding of orthodontic button to tooth 21 with traction wire (Fig. 3); flap replacement; suture with simple stitches using silk thread 3.0 (Fig. 4).

In the postoperative period of 7 days, healing was good, with removal of the suture and the patient was referred again to the orthodontist. After 3 years of follow-up, orthodontic treatment was concluded with satisfactory results from a functional and aesthetic point of view (Fig. 5).

Case report 2
The child D., mulatto, 8 years old, sought the Pediatric Dentistry service to explain the non-eruption of tooth 21. A periapical radiograph revealed the presence of a supernumerary tooth superimposed to the crown image of tooth 21 (Fig. 6). On clinical examination, it was verified that tooth 61 had not exfoliated. A surgical procedure was performed to remove the supernumerary tooth. As there was adequate space for tooth 21 to erupt and because rhizogenesis of this tooth was not complete, the option was to wait for it to erupt. However, 10 months after surgery, a panoramic radiograph showed that tooth 21 was not yet in the initial intraosseous position (Fig. 7).

The following was planned: surgery to bond an orthodontic button with traction wire and placement of a fixed appliance in the maxillary arch (Fig. 8). After 15

FIG. 1 - Surgical access; location of supernumerary tooth in the lingual region of non-erupted tooth 21.
FIG. 2 - Supernumerary tooth removed (tubercular shape).
FIG. 3 - Bonding of button on tooth 21 and traction wire in position.
FIG. 4 - Suture with silk thread.
FIG. 5 - Orthodontic treatment concluded after 3 years; gingival line visibly higher in the region of tooth 21.
months, tooth 21 assumed its position in the dental arch, the fixed appliance was removed and the child began treatment with an orthopaedic appliance to correct the lack of space and general misalignment of the teeth. Note the high gingival line in the region of the tractioned tooth (Fig. 9), which in the future, after completion of the orthodontic treatment, may be corrected by gingivoplasty if necessary.

Discussion

The supernumerary tooth results from the formation of geminated teeth in the regions of the anterior maxillary teeth, supernumerary molars and duplication of premolars which, in the absence of syndromes, are seen as a super production of the dental lamina [Pasler and Visser, 2005]. Supernumerary teeth with a tubercular and inverted shape do not normally erupt, and retard or prevent eruption of the central incisors [Fricker and Jayasekera, 2001]. The lack of eruption of a permanent anterior tooth causes concern and directly affects the individual's psychological state, being the reason why the two patients reported in this study sought the professional help of an orthodontist and paediatric dentist (Case 1 and 2, respectively).

Impaction of maxillary central incisors is mentioned in the literature [Cogulu et al., 2008; Giancotti et al., 2008], however Fernández-Montenegro et al. [2006] affirm that after extraction of the supernumerary tooth, the permanent incisors erupt spontaneously if there is sufficient space in the dental arch and if they have eruptive force. In case 1, although there was sufficient space, the option was to perform orthodontic traction of tooth 21 immediately after removal of the supernumerary tooth. The patient's age was taken into consideration (11 years old), and the radiographic exam revealed that rhizogenesis of this tooth was already completed and this would make spontaneous eruption difficult.

In case 2, there was sufficient space in the arch and the radiograph showed that rhizogenesis of tooth 21 was not yet complete, which would favor spontaneous eruption. Nevertheless, after the observation period of 10 months, the panoramic radiograph showed that the tooth had not moved, perhaps because the adjacent lateral incisor was erupting, causing a mechanical barrier to tooth 21. The hypothesis that this tooth had lost eruptive force was not discarded. Thus, a new surgical procedure was performed to bond the orthodontic button.

In both cases, surgical procedures associated with orthodontic treatment were needed. Tyrologou et al. [2005] and Lo Giudice et al. [2008] mention that invasive and surgical techniques can be replaced by a more restrictive attitude in cases in which complications resulting from supernumerary teeth can be controlled.

In case 1 there was a satisfactory result from an aesthetical and functional point of view, and the important role of a multidisciplinary team in managing situations which involve supernumerary teeth and their complications is relevant. In case 2, tooth 21 was already present in the dental arch, but it was observed that the gingival line had a very high insertion. Therefore, it is necessary to wait for the orthodontic treatment to be concluded, in order to assess the final aesthetic result and adopt corrective measures if necessary.

Conclusion

Frequently a multidisciplinary team is required to manage situations that involve supernumerary teeth and their complications.

It is important to have panoramic radiographs taken in children at the beginning of mixed dentition for an early
detection of dental anomalies and associated pathologies.

References


