A rare case of unerupted second deciduous molar located inferior to the second premolar: case report

**ABSTRACT**

**Background** Tooth eruption is defined as the movement of a tooth from its site of development within the alveolar process to its functional position in the oral cavity [Massler et al., 1941]. The process of tooth eruption can be divided into different phases: pre-eruptive bone stage, alveolar bone stage, mucosal stage, preocclusal stage, occlusal stage and maturation stage [Andreasen et al., 1997]. Any disturbance in these phases can lead to eruptive anomalies. The main anomalies in tooth eruption can be classified as follows.

- **Impaction**: defined as a cessation of the eruption of a tooth caused by a clinically or radiographically detectable physical barrier in the eruption path or by an ectopic position of the tooth.
- **Primary retention**: defined as a cessation of the eruption before gingival emergence without a recognisable physical barrier in the eruption path and the ectopic position.
- **Secondary retention**: defined as a cessation of eruption of a tooth after emergence, without a physical barrier in its path or ectopic position; secondary retention can be defined also as half retention, reimpaction, reincluison, ankylosis, submersion [Andreasen et al., 1997].

The incidence of unerupted teeth is usually higher among permanent teeth than among deciduous ones [Walker et al., 2004; Otsuka et al., 2001; Amir et al., 1982; Broadway, 1976; Pinborg et al., 1970]. Of the primary teeth reported as unerupted, second primary molars are the teeth most frequently involved [Walker et al., 2004; Otsuka et al., 2001; Bianchi et al., 1991; Ranta et al., 1988; Tsukamoto et al., 1986; Amir et al., 1982], followed by primary central incisors [Otsuka et al., 2001].

This paper presents a case of inversion of the intraosseous position of a second unerupted deciduous molar and the succedaneous second premolar.

**Case report**

**Clinical examination**

An 8-year old male patient was referred to the Dental Unit of Cittadella Hospital, Veneto region, Italy, for routine dental evaluation, in April 2008. His family and medical history were unremarkable. Extraoral clinical examination was noncontributory, while intraoral clinical evaluation revealed the absence of the right second primary mandibular molar (tooth E according to Palmer). A panoramic radiograph (Fig. 1) was taken to identify dental anomalies and revealed a physiologic development of dentition for an 8-year old boy, with the exception of tooth E and the mandibular right second premolar (tooth 5). Tooth E was unerupted and located inferior to tooth S; its root development was complete and its root apices seemed to be in close proximity to
the mandibular canal. No periodontal space around the roots of tooth E was noticeable, thus suggesting ankylosis. A retardation of dental maturation of tooth 5 was observed, as referred by Kjaer et al. (2008). Finally, tooth 5 and the crown of tooth E appeared to be surrounded by a radiolucent area. Comparison between the panoramic radiograph taken in April 2008 and other three X-ray examinations (August 1999, January 2004 and October 2006) (Fig. 2, 3, 4), showed tooth E always in the same position through the years. A mandibular Denta Scan was performed in order to evaluate teeth morphology, relation between them and with the inferior alveolar nerve (Fig. 5).

**Treatment**

After clinical and radiographic evaluation, it was decided to remove only tooth E. Unfortunately, the surgeon was not able to do that and both teeth were extracted. The surgical procedure consisted of general anaesthesia (considering the proximity of the root apices to the mandibular nerve and the young age of the patient, who was not able to collaborate for a long time), detaching of a full thickness flap and occlusal and buccal osteotomy. Once removed tooth 5, whose crown was deformed (Fig. 6), tooth E was extracted (Fig. 7). The fibrous capsule surrounding the teeth was removed and curettage of the bone, irrigation and suture were performed. Histological examination of the capsule surrounding the teeth (Fig. 8) revealed the presence of a follicular cyst. Furthermore, the root surface of tooth E was in direct contact with bone tissue (ankylosis). Orthodontic treatment was planned in order to close the space between the first permanent molar and the first premolar.

**Discussion**

The developmental anomaly consisting of the impaction of the second primary molar inside the bone in a position inferior to the second premolar has been reported in the literature [Borsatto et al., 1999; Jarvinen, 1994; Raghoebar, 1991; Jameson et al., 1987; Amir et al., 1982]. The exact aetiology of impactions is still unclear; the main suggested factor involved in this topic is ankylosis, probably related to trauma or infection [Kjaer et al., 2008; Gunduz et al., 2007; Indu Shekar, 2003; Borsatto et al., 1999; Raghoebar, 1991; Kurol, 1984]. Other discussed possibilities are odontomas [Otsuka et al., 2001; Amir et al., 1982], pericoronal myxofibrous hyperplasia, ameloblastic fibroma and dentigerous cysts [Otsuka et al., 2001].

Several studies support the hypothesis of a familial tendency in the development of eruptive anomalies [Indu Shekar, 2003; Kurol, 1984; Kurol, 1981; Krakowiak, 1978], however this hypothesis was not confirmed in the present case. Extractive treatment was chosen for prophylactic reasons, in order to avoid
problems that could deal with inclusion:
› problems associated with the growth of the follicle tissue (odontogenic tumors, cysts);
› damage to adjacent teeth (periodontal pockets, noneruption, malposition or possibility of interfering with orthodontic treatment);
› complications of the aging process [Amir et al., 1982].
In this case it was decided to extract the tooth because:
› a normal eruption of tooth E could not occur;
› tooth E was interfering with the development of tooth 5;
› radiographic evaluation suggested the presence of a cyst surrounding both teeth (then confirmed by the histological examination).
Severe infraocclusion and/or primary failure of eruption of deciduous molars often revealed an association with eruptive and developmental disturbances in the permanent dentition [Winter et al., 1997]. That would imply a need for long-term observation and careful attention when orthodontic treatment is performed to close the premolar space.

Acknowledgements

We would like to thank prof. Herman S. Duterloo for his precious comments. We also give special thanks to Prof. Erica Amir, Prof. Jens O. Andreasen, Prof. Maria C. Borsatto, Prof. Frans van der Linden and Prof. Gerry M. Raghoebar for their contributions.

References