Case report: impacted mandibular permanent canine

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Abstract: Background Impacted teeth are those that have not erupted during the time of their normal eruption and remain in the jaws where they are surrounded completely or partially by hard or soft tissues. Impaction is clinically common, involving 20% of the population. The majority of impacted teeth are third molars followed by maxillary canines and the mandibular premolars. Case report A 9-year old girl presented with pain from her lower right part of the mandible and dissatisfaction with the appearance of her teeth. Clinical examination revealed an abscess associated with a root of a primary tooth, caries and infraocclusion of her lower left first primary molar. An orthopantomograph showed hypodontia associated with absence of the left maxillary lateral incisor, mandibular right second and left first premolars. The left mandibular permanent canine was lying horizontally. Treatment Because of the patient’s age and presence of remaining teeth, it was decided to extract the mandibular left primary canine and first molar; a lingual arch type space maintainer was fitted. For the rest of the anomalies it was decided to keep the patient under clinical review at 6 months intervals. Follow-up Eruption of the right permanent canine was noted six months later, whereas on the left side there was no evidence of the canine, even on palpation, and a clinical diagnosis of impaction was made. Monitoring was continued. When the patient was 11 years old, 18 months later, a new oral examination revealed a swelling associated with the eruption of the impacted canine. A new orthodontic assessment was made and it was decided to surgically expose the unerupted canine. However, the patient refused this treatment and 6 months later oral examination showed the canine had erupted. The space maintainer was removed and she was referred for further orthodontic treatment. Conclusion The eruption of an impacted mandibular canine is unreliable in individuals. However, this clinical report highlights the need for early diagnosis and treatment to avoid unnecessary extraction.

Keywords: Canine, Mandible, Impaction.

Introduction

Impacted teeth are those that have not erupted during their normal time and remain in the jaws, surrounded completely or partially by hard or soft tissues. Impaction of teeth is clinically common, involving 20% of the population [Attasalo et al., 1972]. Frequency of impaction differs between races i.e. in Mongoloid races impaction is 2.5 times more frequent than Caucasians [Kramer and Williams, 1970]. The majority of impacted teeth are third molars (mainly in the mandible) followed by maxillary canines and the mandibular premolars [Grover and Lorton, 1985].

Impacted teeth must be considered seriously, especially the canines, as they are large and important for aesthetics as well as function. Impaction of maxillary permanent canines has a reported incidence of between 0.8 to 2.3% [Thilander and Myrberg, 1973]. The occurrence of impaction and/or non-eruption of mandibular canines is unusual, with prevalence rates from 0.05 to 0.4% [Brown et al., 1982]. Several aetiological factors have been related with the impaction of a mandibular canine, such as an eruption disturbance, most often caused by an anomaly of the canine germ itself [Andreasen, 1995]. Only in rare cases are trauma, pathological conditions (odontomes, cyst), crowding, and early loss of primary canines and mandibular fractures involved [Morning, 1980; O’Caroll, 1984; Mitchell, 1993; Costello et al., 1996; Joshi, 2001].

Case report

Initial examination. A 9 and half year-old girl presented in the paediatric postgraduate clinic of Operative Dentistry Department, University of Thessaloniki, Greece. She complained of pain from her right part of the mandible and she was dissatisfied with the appearance of her teeth. During a first
appointment she also said that she had not exfoliated many primary teeth compared with her classmates. No significant medical history was found, nor any extraoral abnormality detected. There was no history of trauma or surgical procedure related to the head or face. An intra oral examination revealed gingival swelling at the area of her mandibular right first primary molar, where part of the mesial root of the tooth was noted.

The teeth present during the first clinical examination were 16, 55, 54, 53, 52, 11, 21, 62, 63, 64, 65, 26, 36, 75, 74, 73, 32, 31, 41, 42, 83, 84, 85, and 46. Active decay was present in many of her primary molars and mandibular first permanent molars. It was noted that her mandibular left first primary molar was infra-occluded and both maxillary primary lateral incisors were retained and firm.

An orthopantomogram (OPT) showed hypodontia associated with the absence in the maxilla of the left lateral incisor and, in the mandible, the right second and left first premolars (Fig. 1a). In addition, the maxillary right lateral incisor appeared microdont. However, the most unexpected finding was the left mandibular permanent canine (33), which was placed horizontally (Fig. 1b). The tooth was positioned with the crown close to the apex of the permanent mandibular lateral incisor and the apex of the half formed root underneath the roots of the submerged left first primary molar.

Treatment. Because of the infected swelling, a course of antibiotics (Amoxycillin Sodium, 50 mg/Kg) was prescribed for four days before the extraction of the root of the mandibular right first primary molar. Dietary and oral hygiene instructions were given. All the decayed teeth were subsequently restored with either amalgam or composite resin restorations. In view of the misplaced canine and to prevent it from impaction, it was decided to follow a conservative approach and to wait for the eruption, because of the patient’s age and the presence of the remaining teeth. To aid eruption, her mandibular left primary canine and first molar were extracted. Thus space was created in the arch, which was then held with a lingual arch space maintainer. For the rest of the anomalies it was decided to keep the patient under clinical review at 6 months intervals.

Subsequent treatment. Eruption of the right permanent canine occurred six months later, whereas on the left side there was no evidence of the canine, even on palpation. Based on this finding a clinical diagnosis of impaction was made. Two options were proposed: to expose the crown surgically and to apply orthodontic forces or to await eruption. These options were discussed with the patient and her parents. Also, the parents were informed that if the patient did not consent and the tooth remained impacted, then the last treatment of choice would be eventual surgically extraction of the canine. Based on the age of the patient and on her resistance to any surgical procedure a decision was made to wait for a possible spontaneous eruption of the teeth.

When the patient was 11 and a half years old, 18 months later, a new oral examination revealed a swelling on the mucosa associated with the eruption of the impacted canine. That was confirmed with a new OPT (Fig. 2). At that time it was discussed with the patient to surgically expose the crown of the teeth as the canine on the other side was now fully erupted. However, she was again negative for this and a decision was made to wait still further for the eruption of the tooth.

Follow-up. The patient was recalled after 6 months, during which time the canine had erupted. A new OPT was taken to confirm the position of the rest of the

**Fig. 1a - Radiographic appearance at the time of presentation at the age of 9 years. Note the absence of 22, 34 and 45 the microdont 12 and the lying position of 33.**

**Fig. 1b - Close up of previous OPT at the age of 9 years. Note the horizontal position of 33.**
unerupted teeth, which showed a good position of the mandibular left permanent canine in the arch (Fig. 3a).
Six months later, when the patient was then 12 years, a clinical examination revealed the fully erupted mandibular left permanent canine (Fig. 3b). The space maintainer was, therefore, removed and the patient referred for orthodontic treatment.

Discussion
There have been few reports of impaction of mandibular permanent canines because cases are rare [Röhrer, 1929; Mead, 1930; Sham et al., 1978; Brown et al., 1982]. However, the presence of the anomaly seems to be very old. Nodine [1943] noted that the oldest human specimen showing an impacted and unerupted left mandibular canine was found in France in 1908 and estimated to be 40,000 years old.
Impacted canines are often discovered incidentally on routine radiographic examination without having produced any apparent symptoms suggestive of their presence. However, the prolonged retention of the primary antecedent is quite often a reliable clue leading to the discovery of its impacted permanent successor [Broadway, 1987]. The patient in our case presented with pain in her lower right mandible and a routine radiographic examination revealed the horizontally placed mandibular canine.
Eruption of mandibular canines occurs between 9 to 10 years old [McDonald and Avery, 1994]. For that reason initially the diagnosis was made of a misplaced canine and only later, when the corresponding canine was fully erupted, the final diagnosis was impaction. According to the patient’s history it is most likely that the cause of this the impaction was the abnormal displacement of the tooth germ.
The long-term events taking place after impaction of mandibular canines have not been adequately researched. From clinical experience it appears that these teeth remain asymptomatic and without pathological lesions [Grover and Lorton, 1985]. However, in some cases, follicular cysts may develop and lead to severe displacement not only of the canine but also of adjacent teeth [Mourshed, 1964; Brown et
al., 1982]. The mandibular canine is the only tooth to have been shown to cross the mid-line and such an abnormal movement of a tooth has been termed transmigration [Bruszt, 1958]. Occasionally these migrated teeth have been taken for supplemental canines. However, several studies have shown that the innervation of these teeth is derived from the opposite side [Bruszt, 1958; Pratt, 1969].

The treatment options for the management of unerupted canines according to Iramaneerat et al. [1998] can include:
- no active intervention;
- early removal of the primary canine (with or without a space maintainer);
- surgical removal of the impacted canine;
- transplantation.

In this clinical case early removal of the primary canine and the first primary molar, with retention of the arch space with a space maintainer, was the treatment of choice. Costello et al. [1996] suggested that if the canines are seen to be slightly ectopically placed, then judicious and prompt removal of the primary canines might encourage the correct eruption of these teeth. However, for those canines that are grossly displaced the orthodontic/surgical intervention may be required. A study of 15 cases with eruption disturbances of mandibular permanent canines by Taguchi et al. [2001] showed that it is relatively easy for the position of unerupted mandibular canines associated with calcified obstacles to be improved by removal of the obstacle, but that it is more difficult for teeth showing the anomaly, in the position of the canine germ, to be aligned within the dentition.

Conclusions
The eruption of an impacted mandibular canine is unreliable in the individual. However, this report shows that early diagnosis of such anomalies is important. Eruption of an impacted tooth can occur spontaneously, avoiding unnecessary extraction.

References
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