

## Bilateral congenitally missing maxillary canines. A case report

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### Abstract

Exclusive aplasia of maxillary permanent canines is extremely rare. There are only a few cases of this condition reported in the literature. This paper reports a case of bilateral congenitally missing canines in a healthy 11 year old male of Chinese origin. The article discusses problems in diagnosis and presents options in the management of such a case. The management option selected was the most appropriate for the family at the time of presentation.

Key words: Aplasia, bilateral, Chinese origin, congenitally missing, hypodontia, maxillary canines, case report.

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### Introduction

Exclusive aplasia of maxillary permanent canines is rare. There are only a few cases of absence reported in the literature.<sup>1,2</sup> Several epidemiological studies have been conducted. Jarvinen and Vaataja<sup>1</sup> cite three studies illustrating this anomaly, and show the incidence to be at the most 3.3 per cent of missing teeth. Hunstadbraten<sup>2</sup> conducted a study in 1973 of 1295 children in Modum, Norway, and found mandibular second bicuspid accounted for 45.8 per cent of missing teeth, the maxillary second bicuspid 28 per cent, and the lateral incisor 11.7 per cent. Of the children, 264 had missing teeth and of these, one was a girl with a single missing canine. The study included radiographic and clinical diagnosis. Zhu *et al.*<sup>3</sup> concur with Hunstadbraten's results for the Caucasian population, but point out that in Asian dentitions, the most commonly missing tooth is the mandibular incisor.

The retention of a primary tooth beyond its normal 'exfoliation date' usually can be attributed to the permanent successor (or neighbouring permanent tooth) being either congenitally missing,

impacted or malpositioned.<sup>4</sup> Primary teeth that have been found to be present in 21-year-olds are, in order of frequency of occurrence: maxillary canines, mandibular second molars, maxillary second molars and mandibular canines. Primary second molars have been found to be present in people who have attained 80 years of age.<sup>4</sup>

The primary canine is the most commonly found retained deciduous tooth because it is more likely that a permanent canine will deviate from its normal course of eruption and become impacted.<sup>4</sup> Fox *et al.*<sup>5</sup> place the incidence of ectopic eruption of permanent canines at 1.5-2 per cent of the population. The maxillary permanent canine develops beneath the orbit, superior and palatal to the lateral incisor and the first premolar. Eruption occurs in a mesial and lateral direction. It is possible, during the eruption phase, to palpate it high in the labial sulcus. Genetic factors, bone disease, tumours, cysts, crowding and persisting deciduous canines have been attributed as causes of ectopic eruption of permanent maxillary canines. Transposition, although relatively rare, can occur with first premolars, and less often with lateral incisors or even less often with central incisors or second premolars.<sup>6</sup>

Early detection of ectopic maxillary canine teeth is important if optimum interceptive treatment is to be carried out;<sup>5</sup> however, late recognition and referral is common. This is due to the anatomic similarity to its deciduous predecessor and its late eruption age compared with the rest of the dentition.<sup>4</sup> The average age for shedding the deciduous maxillary canines is 11.6 years for a male and 10.75 years for a female.<sup>4</sup> The crown of the canine should be detectable as a bulge in the buccal sulcus as early as eight years of age. Where the crown cannot be palpated by ten years of age, ectopic eruption should be suspected and radiographic analysis is mandatory before a treatment decision can be made.<sup>7</sup>

Graber<sup>8</sup> claims that congenital absence of teeth is largely due to heredity factors and, when it occurs,

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**Fig. 1.** – Anterior view of occlusion showing the 33 and 43 labially placed and small maxillary canines.



**Fig. 2.** – Lateral view clearly shows the small peg-shaped maxillary canine with signs of attrition.

family history is important. In addition it is important to distinguish whether the anodontia is related to systemic or non-systemic causes. Furthermore, there are 'predisposing genotypes' which, when combined at critical times of tooth development with certain pre- or post-natal conditions, could affect the developing tooth system, resulting in abnormal tooth formation or complete absence.<sup>8</sup> There seems to be a high correlation of hypodontia and a number of systemic syndromes, which indicates that, in some cases, this could be due to a more generalized congenital disturbance.<sup>8</sup>

This paper presents a report of a recently examined case of bilaterally missing maxillary permanent canines.

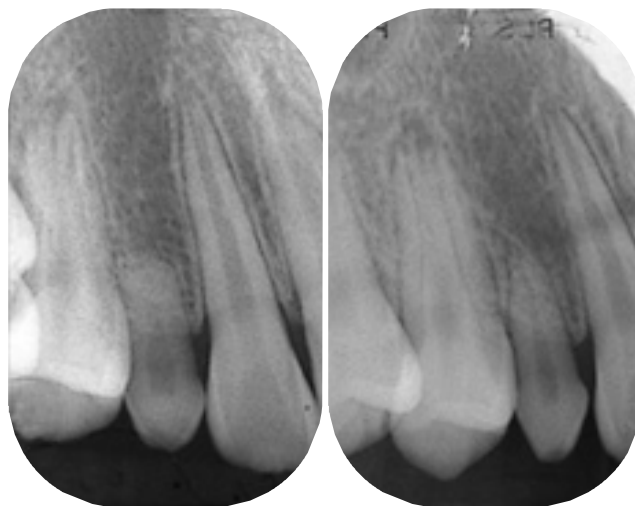
#### **Case report**

A healthy 11 year old boy of Chinese origin presented in April 1997 for a routine dental examination. He had arrived in Australia 12 months previously, and was the only child in a nuclear family. He weighed 43 kg and was 145 cm tall. Intra-oral examination revealed a mixed dentition and a Class I malocclusion with an overjet and overbite of 3 mm. There was evidence of crowding in the lower arch, with the 33 and 43 labially placed (Fig. 1). Deciduous teeth 55 and 85 were still present. There was evidence of caries on the mesial and distal aspects of tooth 85 which was mobile and asymptomatic. It was decided, therefore, to leave it to exfoliate naturally. Tooth 55 had a satisfactory distal amalgam restoration. All first permanent molars had been previously fissure sealed. Clinical examination of the soft tissues revealed generalized gingivitis with bleeding points around the 12, 11, 21, 22, 33 and 43 in particular. Pocket depths were within the normal range with no evidence of recession or mucogingival involvement.

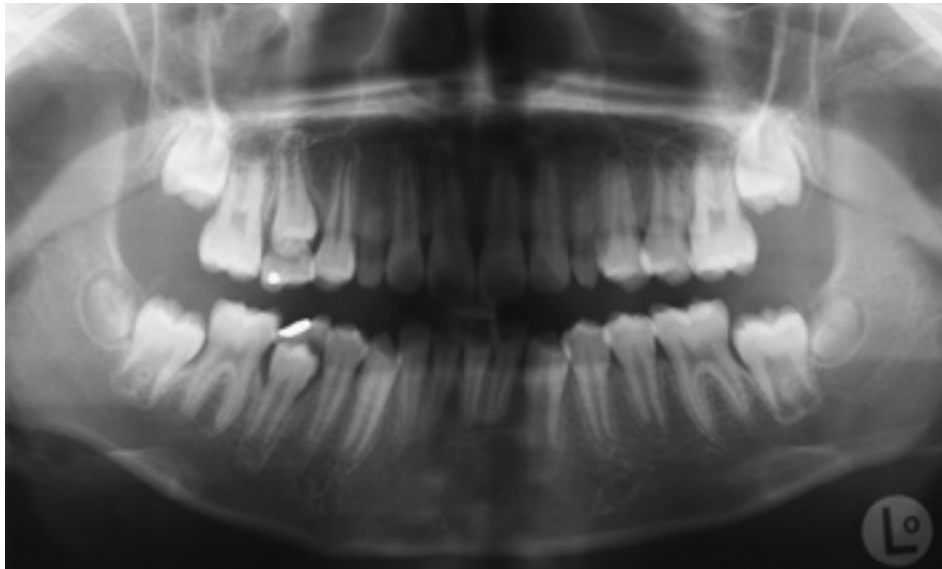
Clinical examination of the maxillary teeth revealed small, peg-shaped canines showing signs of

attrition on both right and left sides (Fig. 1, 2). They were approximately one-third the size of their adjacent laterals and were not mobile. It was questionable whether these were permanent canines; however, palpation of the buccal sulcus failed to indicate the presence of unerupted permanent maxillary canines.

Periapical radiographs (Fig. 3) confirmed that the erupted canines were deciduous because of their enamel structure, canal size and small roots. The right canine in particular had a short and bulbous root with evidence of some external root resorption. As the permanent canines could not be detected on the periapical radiographs, a panoramic radiograph was ordered to ascertain the presence and location of the canines in question and to check for any other abnormalities. The radiograph (Fig. 4) confirmed bilateral missing maxillary canines and maxillary third molars. There was no relevant family history for this condition nor was there a history of previous extractions.



**Fig. 3.** – Periapical radiographs showing small bulbous roots with evidence of external root resorption.



**Fig. 4.** – Panoramic radiograph showing bilaterally missing permanent maxillary canines and third molars.

The initial treatment plan for this child was preventive in nature: intensive oral hygiene instructions in order to address the gingival condition; a professional clean using a prophylactic paste to remove dental staining and fluoride treatment using 1.23 per cent NaF gel in a fluoride tray for four minutes. Orthodontic opinion was sought regarding the congenitally missing maxillary canines and the lower anterior crowding. Regular recalls were necessary to review the gingival condition, the status of the dentition and, in particular, the deciduous canines.

### Discussion

In this case it was decided to further investigate the presence of the maxillary permanent canines for the following reasons:

1. There was some doubt as to whether the clinically present maxillary canines were deciduous or permanent.
2. The permanent canines could not be palpated in the buccal sulcus.
3. The prevalence of the ectopic eruption of maxillary canines is about 2 per cent of the population.
4. Early detection of missing canines is important to enable appropriate interceptive orthodontic treatment.
5. The possibility of inversion of maxillary canines or displacement of the canines into the palate was of concern. Power<sup>9</sup> claims palatal displacements account for 85 per cent of cases of maxillary canine impaction.
6. Ectopic eruption of canines is reported to be responsible for some 12 per cent of root resorption

of permanent incisors in children 10-13 years of age.<sup>9</sup>

7. There was also the remote possibility that the teeth may be congenitally missing, or their eruption impeded by some unusual oral pathosis, such as a supernumerary tooth or an odontome.

The panoramic radiograph confirmed congenitally missing maxillary permanent canines and maxillary third molars. There was no other obvious pathosis. An orthodontic opinion was sought regarding the congenitally missing maxillary canines and the associated malocclusion.

Several management protocols were then proposed to the father of this young boy. The first was not to intervene at this stage. The child's family would decide at a later date to seek orthodontic and/or prosthetic treatment when they could afford to do so. The concern with this option was that root resorption of the deciduous canines had already begun and that these teeth may exfoliate in the near future with subsequent loss of space. Under this option the status of the deciduous canines needed to be monitored closely.

The second option was to refer the child to an orthodontist to consider the extraction of the two deciduous canines now, and orthodontically reposition the two premolars into the permanent canine positions. The lower anterior crowding could be corrected at the same time. This would involve full fixed appliance therapy and expense to the family.

A third option was to build up the two deciduous canines with resin composite to resemble the permanent canines. This option was considered undesirable due to the poor long-term prognosis of

the deciduous canines associated with the commencement of external root resorption; the poor occlusal relationship between the upper and lower canines; and the expected poor aesthetic result with respect to the level of the gingival margin of the present deciduous canines in comparison with that of the adjacent teeth.

The family was not keen to undertake any treatment at this stage and preferred the first option which allowed them the time to gather finances that would assist them with the provision of optimum orthodontic treatment at a later date. The status of the deciduous canines is being monitored regularly with a view to referring the young boy for orthodontic assessment and treatment prior to their exfoliation.

## Conclusion

A recent report of a rare condition of bilateral congenitally missing maxillary permanent canines in an eleven year old boy of Chinese origin is presented with possible management options. The management option selected was the most appropriate for the family at the time of presentation.

The authors support the recommendations made by Fox *et al.*<sup>5</sup> and Ferguson,<sup>7</sup> that early radiographic investigation (by the age of 10-11 years) must be undertaken where there is any doubt regarding the eruption pattern of permanent canines.

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