Management of the Impacted or Displaced Maxillary Canine

Giles Kidner, Joe Noar and Robert D Evans

The maxillary canine is commonly displaced or impacted. Monitoring the normal development of the dentition is important to identify and treat potential problems and hence minimise the need for later, more complex therapy. This paper discusses some problems that may occur and the subsequent treatment of these problems, by illustration with five case reports.

Key Words: Dentition, Development, Eruption, Canine, Impaction, Transposition

Introduction

Careful monitoring of the transition between the mixed and permanent dentition is important to identify any potential problems which may, in time, cause local irregularities. In many cases interceptive treatment can eliminate the need for any further complicated procedures. The times at which primary teeth exfoliate and their permanent successors erupt are very variable. The average eruption times are shown in Table 1.

When examining the developing dentition of a child it is important to look for:

• Unusual or asymmetric eruption patterns.
• Retained or submerging primary teeth.

A series of short case histories will be presented to highlight and illustrate some of the common problems associated with the maxillary canine.

Case 1. Unilateral 3\degree Displacement—Early Presentation

AM, aged 11 years, was referred after routine examination revealed no canine bulge palpable in the buccal sulcus above the right deciduous canine whereas the canine was easily palpable on the left side. The overjet and over-bite are within normal limits and the buccal segments are Class I. The upper right lateral incisor is smaller than the average and this is quite common in cases of displaced permanent canines.

Radiographs show the canine is mesio-angular and palatally placed (Figure 1). The crown is overlying the root of the lateral incisor and there is no evidence of resorption of the deciduous canine.

Treatment

Early extraction of the deciduous canine may help to encourage the permanent canine to correct its path of eruption. A radiograph (orthopantomograph, OPG) should be taken at 12-monthly intervals to monitor progress (Figure 2).

Opinion

This case should be assessed by a specialist and advice given.

Evidence

• Ericson S, Kurol J. 1986. 1.7% maxillary canines are impacted. 6:1 palatal:buccal ratio.
• Becker A, Smith P, Behar H. 1981. Impacted canines are more common where the lateral incisor is

Table 1: Typical ages of eruption of the permanent teeth

<table>
<thead>
<tr>
<th></th>
<th>Time of eruption (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maxillary dentition</strong></td>
<td></td>
</tr>
<tr>
<td>Central incisor</td>
<td>7.5</td>
</tr>
<tr>
<td>Lateral incisor</td>
<td>8.5</td>
</tr>
<tr>
<td>Canine</td>
<td>11.5</td>
</tr>
<tr>
<td>First premolar</td>
<td>10.0</td>
</tr>
<tr>
<td>Second premolar</td>
<td>11.0</td>
</tr>
<tr>
<td>First molar</td>
<td>6.0</td>
</tr>
<tr>
<td>Second molar</td>
<td>12.0</td>
</tr>
<tr>
<td><strong>Mandibular dentition</strong></td>
<td></td>
</tr>
<tr>
<td>Central incisor</td>
<td>6.5</td>
</tr>
<tr>
<td>Lateral incisor</td>
<td>7.5</td>
</tr>
<tr>
<td>Canine</td>
<td>10.5</td>
</tr>
<tr>
<td>First premolar</td>
<td>10.5</td>
</tr>
<tr>
<td>Second premolar</td>
<td>11.0</td>
</tr>
<tr>
<td>First molar</td>
<td>6.0</td>
</tr>
<tr>
<td>Second molar</td>
<td>12.0</td>
</tr>
</tbody>
</table>

The eruption times can vary by up to +/-20%
• Ericson S, Kurol J. 1988.³
78% of impacted canines had normal eruption following removal of the deciduous canine.

Case 2. Unilateral 3 Displacement—Late Presentation
RS, aged 13 years, was referred because of the late eruption of the upper left canine. There is no canine bulge palpable in the buccal sulcus above the deciduous canine. The overjet and over-bite are within normal limits and the buccal segments are Class I. The upper lateral incisor is smaller than normal.

Radiographs show that the canine is mesio-angular. The vertical parallax technique with the OPG and occlusal radiographs is used to identify the labio-palatal position of the unerupted tooth (Figures 3-5). It is clear that the crown of the tooth moves in the same direction as the x-ray tube, indicating a palatal position. The crown is overlying the root of the lateral incisor and there is very little resorption of the root of the deciduous canine.

Treatment
The canine tooth is too far displaced and the patient too old to be influenced by the extraction of the deciduous canine. This case will need exposure and bonding of the canine. Space will have to be made around the deciduous canine to accommodate the permanent successor.

Opinion
This case requires referral for specialist orthodontic and surgical care.

Evidence
• Ericson S, Kurol J. 1988.³ If the crown of permanent canine lies mesial to the mid-line of the upper lateral incisor, then spontaneous eruption following removal of the deciduous canine is less likely. The ideal age for removal of the deciduous canine is 10-13 years.
• Southall P, Gravely J. 1989.⁴ Suggest the use of vertical parallax to identify the position of unerupted maxillary canines.

Case 3. Bilateral 33 Displacement and Resorption of 22
RW, aged 14 years, was referred because of late eruption of the upper canines. Examination shows that 33 and 43 are still present and firm. The upper and lower arches are well aligned and the overall occlusion is Class I with a mild Class III tendency. The lateral cephalometric radiograph indicates the vertical positioning of the canines. The 33 are palatally displaced and the roots of 22 appear to be resorbed. There is some resorption/short roots of other teeth; this maybe idiopathic. See Figures 6-8.

Treatment
Urgent surgical exposure of 33 is required to facilitate their alignment and to prevent any further resorption of 22. The long-term prognosis of 22 is guarded. Removing the cause of the resorption (that is, position of 33) should prevent any further resorption of 22.

Opinion
This case highlights the need for careful monitoring of the developing dentition. Resorption of 22 could have been prevented if the appropriate radiographs had been taken at the right time. This case requires referral for specialist orthodontic and surgical care.

Evidence
• Ericson S, Kurol J. 1988.⁵ 0.7% of 10-13-year-olds have resorption of incisors caused by ectopic canines. Root resorption is expected in 12.5% of incisors adjacent to ectopic maxillary canines.
Case 4. Bilateral 3|3 Displacement with Resorption of 2|2

AS, aged 14 years, was referred to the orthodontic department with a Class II division 1 malocclusion and average facial proportions. The upper and lower arches are well aligned with mesio-labially inclined and rotated 2|2. 3|3 are labially placed and unerupted. The overjet is increased and the over-bite increased and complete. The buccal segments are Class II. Radiographs show 3|3 to be mesio-angular, overlying 2|2 and there is evidence of damage to the roots of 2|2. See Figures 9-11.

Treatment
In view of the damage to the roots of the lateral incisors and the fact that space is required to reduce the increased overjet and over-bite as well as the mesial position of the canines, the preferred treatment plan is to extract 2|2 and orthodontically align the 3|3 in their place. The advantages of this course of action are that the extractions are at the site of the crowding, the canines are naturally disimpacted and the lateral incisors may have a limited prognosis. There are potential problems to consider, however. The canine crowns may be rather bulky in the lateral incisor position and the crowns may be very yellow compared to the central incisors. Some characterisation of the canine crown is usually required to improve appearance.

Opinion
This case should be referred for specialist orthodontic care.

Case 5. Transposed 4|3 and Impacted 5

SM, aged 15 years, was referred for an orthodontic opinion. Her occlusion is essentially Class I but is complicated by the presence of 4|3 mesial to the erupted 3 and retained 5. Radiographs show that the 5 is developing mesial to the 3 but that the root formation is slow compared to the 4. The 5 is present but palatally displaced. See Figures 12-14.

Treatment
The management of this case is complicated and requires exposure of 5 for traction together with the loss of 3 and extraction of the 4 to encourage the eruption of 5.

Opinion
The possibility of a transposition of 4|3 and displacement of 5 could have been identified earlier if the appropriate radiographs had been taken to supplement the clinical examination. If the developing transposition had been identified at an early stage, removal of the deciduous canine may have led to normal eruption of the permanent canine. The management of this case is now complicated and lengthy with an element of doubt over the development of the 4. This patient requires urgent referral for specialist orthodontic and surgical care.

Evidence
- Peck, Peck. 1995.6

Transposition of the maxillary canine with the maxillary first premolar is the commonest type of transposition—71%. 27% are bilateral and there is a strong familial tendency—11%.
Recommendations

- Monitor developing dentition as part of normal dental inspection.
- Palpate for maxillary canines labially.
- A tipped, displaced or mobile permanent lateral incisor may indicate a problem.
- Pay attention to unusual and asymmetric eruption patterns.
- Take appropriate radiograph(s) if problems are suspected at nine years of age.
- Do not extract teeth without appropriate radiograph(s).
- Extraction of deciduous canines may be indicated where the position of the canine is abnormal.
- Refer as soon as possible for specialist advice if concerned.
- Remember that timely referral and action can prevent serious complications developing.

References


Essential Reading


Correspondence: G Kidner, Consultant Orthodontist, Stoke Mandeville Hospital, Mandeville Road, Aylesbury HP21 8AL.