Conservative management of lower second premolar impaction

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Abstract
Lower second premolars account for approximately 24 per cent of impactions, excluding third molars, even though most reports in the literature relating to impacted teeth address the maxillary canine, with relatively few reports on the lower second premolar. Conservative management involves surgical exposure of the crown, however, subsequent premolar eruption is unpredictable.
A case is described in which removal of a deciduous second molar was followed by eruption of an unfavourably inclined premolar located deep within the alveolus. Sufficient time must be allowed for eruption and in the present case 16 months elapsed before the tooth had erupted to the level of the occlusal plane.

Key words: Lower premolar impaction, case report.

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Introduction
Lower second premolars account for approximately 24 per cent of impactions, excluding third molars, with the overall frequency for lower premolar impactions being 0.2-0.3 per cent. Aetiological factors for premolar impaction appear to include arch length deficiency, ectopic position of the tooth germ, obstacles to eruption such as an ankylosed primary molar, the presence of supernumerary teeth or odontomas and genetic factors. Most reports in the literature relating to impacted teeth address the maxillary canine, with relatively few reports on the lower second premolar.

Conservative management with exposure of the crown has been advocated. The majority of reported cases involved distally impacted premolars in which the long axis was inclined to favour eruption if exposed. Surgical exposure is unpredictable and best limited to cases with no more than 45° tilting of the long axis from its normal position.3

In some cases, orthodontic traction and repositioning may be indicated. Exposure and bonding can be technically demanding and extreme cases are best not exposed but, instead, managed with a wait and see approach. Becker recently discussed two cases of surgical exposure followed by bonding of an attachment for traction. One of these cases was a failed attempt at bonding and traction, underscoring the difficulty of access for bonding. If the primary molar and premolar are in close association, extraction of the molar may be all that is required to allow for eruption. As long as tilting of the premolar is slight and it is not too deep in the alveolus, removal of the deciduous molar will usually result in premolar eruption.

Jacobs documented six cases of successful exposure and eruption. In all six cases, the axial root inclination favoured eruption. Andreasen illustrated successful and unsuccessful cases of exposure of a horizontally inclined premolar. A single case of a horizontally inclined premolar (long arch aligned with arch) erupting without orthodontic intervention, following extraction of the first permanent molar, was outlined by Howard. The mesial molar root showed signs of resorption, inferring a distal migratory path for the premolar, which then presumably took the path of least resistance through the molar extraction socket. It has been hypothesized that, following exposure, forces act on the tooth to direct it toward the exposed area; the tooth being carried along with the reparative changes as the bone defect reduces in size.

In some cases where the premolar demonstrates significant deviation from its normal inclination, surgical repositioning of the premolar or autotransplantation should be considered.

Case report
A 13 year old female presented for examination with radiographic evidence of a horizontally inclined lower right second premolar, with the unusual feature of its long axis lying transversely. The...
panoramic radiograph is reproduced in Fig 1. Of note was a retained 85 and a horizontally inclined 45. The crown and root apex could be easily palpated on the buccal and lingual aspects of the dentoalveolar ridge, respectively. The patient had very good dentofacial aesthetics with an overall Class 1 occlusion and well aligned arches (Fig 2).

A conservative approach was outlined to the patient, consisting of extraction of the 85 and space maintenance by means of orthodontic bands on the 44 and 46, with a sectional archwire to prevent tipping into the edentulous site. In consultation with the general dentist, the extraction was performed. Surgical exposure through the socket was not attempted as there were concerns about uncovering and damaging the root surface due to the horizontal transverse orientation. The family was told that, if the tooth failed to erupt, surgical exposure with orthodontic traction would be required and, if this failed to mobilize the tooth, prosthetic management would be indicated. Due to the advanced root development (note other premolars on the panoramic radiograph), surgical repositioning and autotransplantation would not be viable treatment alternatives.

The patient failed to attend some check visits; however, 10 months after the extraction the patient was reviewed and the premolar found to be partially erupted. Sixteen months after the extraction, the 45 had reached the level of the occlusal plane. At this time, to detail its final position, the 45 was bonded, and a sectional archwire placed from 44 to 46.

Discussion and conclusion
Ideal premolar positioning (Fig 3) was obtained with minimal treatment. The case serves to illustrate that even unfavourably inclined premolars located deep within the alveolus can successfully erupt with a conservative approach such as removal of a deciduous molar. Patience is required and if extraction of the retained deciduous molar is performed in the mixed dentition stage, and the tooth fails to erupt, any later comprehensive fixed appliance treatment can still be completed by the mid-teens. Importantly, earlier treatment with incomplete root development is more successful where surgical repositioning or autotransplantation are indicated. Comprehensive scientific studies of treatment modalities for impacted lower premolars are lacking, presumably due to their low rate of
occurrence. Although the overall success rates in cases such as that discussed above have not been clearly documented, the deciduous extraction and monitor option may provide a non-invasive and cost-effective approach.

References

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