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# Double Permanent Incisor Teeth: Management of Three Cases

**Abstract:** Double teeth in the permanent dentition have a reported incidence of 0.1% for Caucasian groups. Common associated problems include adverse aesthetics, caries, periodontal disease, and malocclusions. Management can be challenging, often requiring a multidisciplinary approach. Three cases are presented illustrating the variety of treatments available.

**Clinical Relevance:** Double teeth are dental anomalies which can present with an array of complications, requiring a variety of treatment modalities.

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Dental twinning results from abnormal events in the embryological development of teeth.<sup>1</sup> Terms which are also commonly used to describe this anomaly are fusion, gemination, concrescence, and double teeth. According to current definitions, gemination is the partial development of two teeth from a single tooth bud following division.<sup>2</sup> This is incomplete in most cases and results in a single root with only one root canal but two completely or incompletely separated crowns. Fusion is the union of two or more separate developing teeth, between either the dentine or enamel, or both.<sup>3</sup> In most cases, this results in a tooth with a broad crown and two distinct root canals. If fusion occurs at the cemental level, the term concrescence is used.

In order to differentiate between the two anomalies, it has been suggested that the teeth in the arch be counted with the anomalous crown counted as one. A full complement of teeth indicates gemination, whilst one tooth less than normal indicates

fusion. It is not always possible, however, to differentiate between gemination and a case in which there has been fusion between a normal tooth and supernumerary tooth. For this reason, the terms 'double teeth' and 'connation' are useful as they are purely descriptive terms and have no inference to aetiology.

The exact aetiology of these anomalies is unknown and may be different for fusion and gemination. Possible theories proposed include physical pressure leading to the union of teeth, genetic inheritance, or environmental factors.<sup>3</sup> Double teeth may also be part of syndromes such as achondrodysplasia and chondroectodermal dysplasia. There is strong evidence for a genetic origin for fused teeth, most likely to be an autosomal recessive or dominant inheritance with very little penetrance.<sup>4</sup>

Double teeth occur more frequently in the primary dentition than the permanent dentition, with a literature review revealing an approximate prevalence of 0.6% and 0.1%, respectively for Caucasian groups.<sup>3</sup> Bilateral presentation is rare, with prevalence estimates of 0.02% in both primary and permanent dentitions.<sup>5</sup> It has been shown to be more prevalent in Mongoloid populations than in Caucasian populations, with no statistical difference with respect to gender identified.<sup>3,4</sup> Gemination is more prevalent in the anterior maxillary dentition, with fusion more commonly found in the anterior

- Accept
- Selective removal of tooth substance
- Composite material addition
- Surgical division of tooth
- Endodontic management
- Extraction of whole or part of double tooth
- Gingivoplasty
- Removable prosthesis
- Fixed prosthesis
- Implant placement
- Orthodontic treatment

**Figure 1.** Alternative treatment options which can be used in isolation or combination.

mandibular dentition.<sup>5</sup>

A variety of complications have been reported with these anomalies, including caries, periodontal disease, aesthetic problems and malocclusions. Different treatment modalities should be used according to the requirements of the situation. Alternative options are outlined in Figure 1.

The following cases illustrate a variety of alternatives.

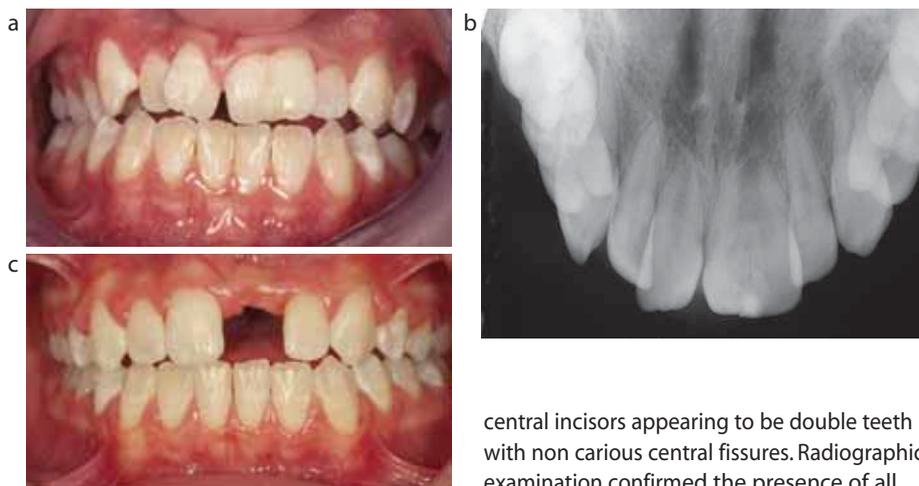
## Case 1

A fit and well 8-year-old boy was referred by his general dental practitioner regarding the appearance of his upper permanent central incisors (Figure 2a). He was in the mixed dentition, with both upper

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**Figure 2.** (a) Intra-oral photograph of Case 1 at initial assessment, with double incisor teeth with stained central fissures. (b) Periapical radiograph of Case 1 illustrating the single roots of the upper central incisors. (c) Intra-oral photograph of Case 1 following composite restoration of incisor teeth. (d) Extra-oral photograph of Case 1 on completion of treatment.



**Figure 3.** (a) Intra-oral photograph of Case 2 at initial presentation illustrating upper left central incisor. (b) Radiograph of Case 2 illustrating single root canal of upper left central incisor. (c) Intra-oral photograph of Case 2 following extraction of upper left central incisor and fixed appliance treatment.

central incisors appearing to be double teeth with non carious central fissures. Radiographic examination confirmed the presence of all permanent teeth and open apices of the incisors, with single root canals (Figure 2b).

Simple composite restorations were placed to camouflage the deformities and prevent caries developing in the fissures (Figures 2c, d). The patient and his mother were pleased with the result. In later

life, more complicated treatment options are still available if indicated.

### Case 2

A healthy 11-year-old boy was referred by his general dental practitioner regarding the appearance of his large upper left permanent central incisor (Figure 3a). The tooth had previously been restored with a composite restoration to improve aesthetics and prevent caries.

On examination, all permanent teeth, with the exception of third molars, were erupted. The upper right central incisor was rotated, with a width of 7.5 mm. The upper left central incisor width was 12 mm, with a prominent incisal notch. Overcrowding was evident in both arches.

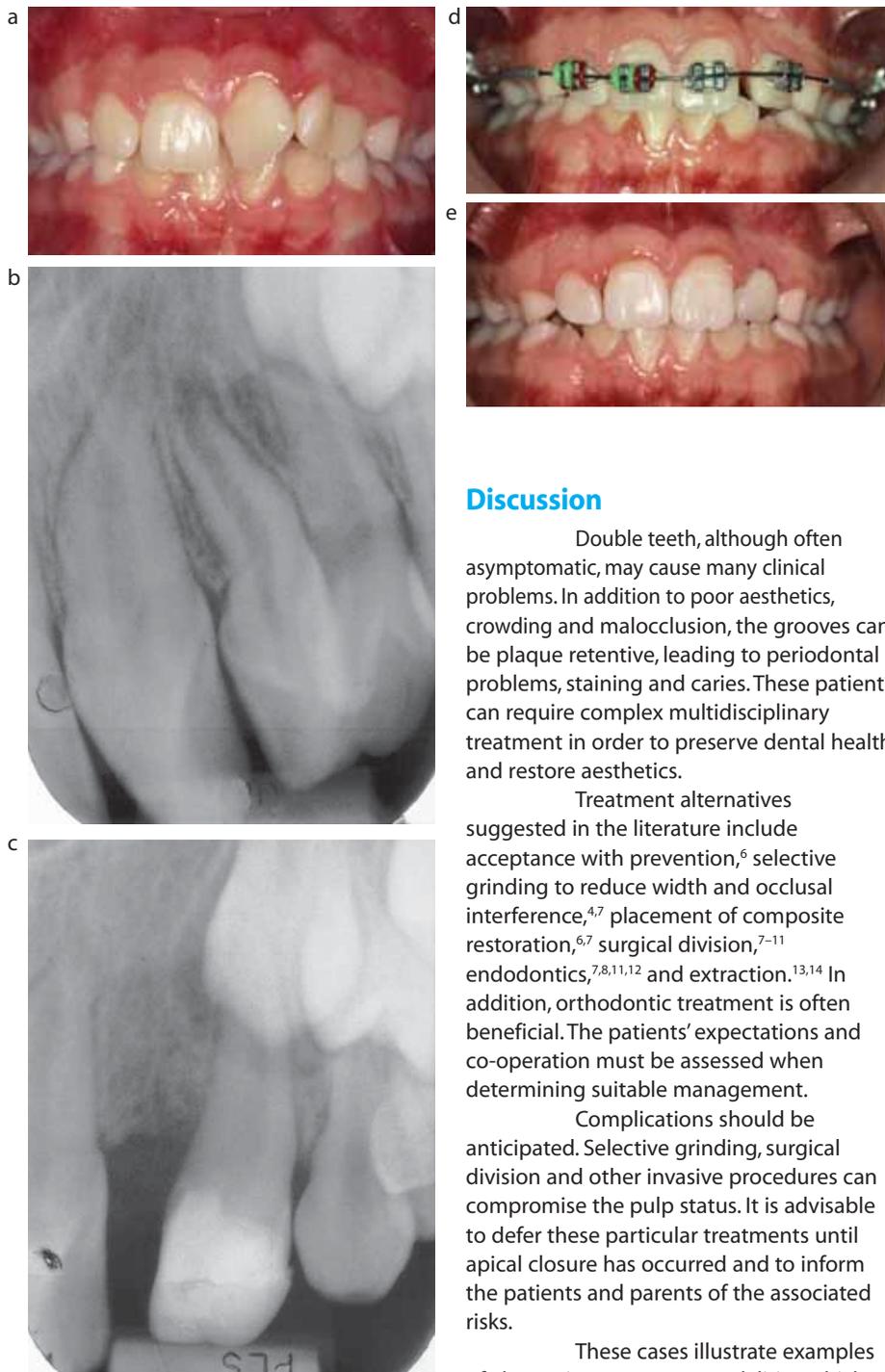
Radiographic examination of the upper left central incisor revealed a heart-shaped pulp chamber with a single root canal (Figure 3b).

Following full discussion of all treatment options, it was decided to extract the double tooth and align the dental arches with fixed appliances (Figure 3c). A T-shaped upper partial denture was provided for six months which may be replaced by an adhesive bridge if necessary. Once growth has ceased a single tooth implant may be provided.

### Case 3

A fit and well 9-year-old girl was referred by her general dental practitioner regarding the appearance of the upper left permanent lateral incisor (Figure 4a).

Clinical examination revealed her to be in the early mixed dentition, with the presence of all permanent teeth confirmed radiographically. The upper left lateral incisor was a double tooth, with two distinct root canals and open apices (Figure 4b). One year later, following radiographical apical closure, the double tooth was sectioned. The mesial segment was extracted as a result of the unfavourable root morphology and the distal segment was restored with a direct composite restoration (Figure 4c). The remaining tooth was closely monitored and retained its vitality. Two years later, a fixed appliance was placed to level and align the upper incisors (Figure 4d). An excellent aesthetic result was achieved (Figure 4e).



**Figure 4.** (a) Intra-oral photograph of Case 3 illustrating dysmorphic upper left lateral incisor. (b) Periapical radiograph of Case 3 illustrating two distinct root canals of upper left lateral incisor. (c) Periapical radiograph of Case 3 following sectioning and restoration of upper left lateral incisor. (d) Intra-oral photograph of Case 3 showing upper fixed appliance utilized to align incisors. (e) Intra-oral photograph of Case 3 following completion of treatment.

### Discussion

Double teeth, although often asymptomatic, may cause many clinical problems. In addition to poor aesthetics, crowding and malocclusion, the grooves can be plaque retentive, leading to periodontal problems, staining and caries. These patients can require complex multidisciplinary treatment in order to preserve dental health and restore aesthetics.

Treatment alternatives suggested in the literature include acceptance with prevention,<sup>6</sup> selective grinding to reduce width and occlusal interference,<sup>4,7</sup> placement of composite restoration,<sup>6,7</sup> surgical division,<sup>7-11</sup> endodontics,<sup>7,8,11,12</sup> and extraction.<sup>13,14</sup> In addition, orthodontic treatment is often beneficial. The patients' expectations and co-operation must be assessed when determining suitable management.

Complications should be anticipated. Selective grinding, surgical division and other invasive procedures can compromise the pulp status. It is advisable to defer these particular treatments until apical closure has occurred and to inform the patients and parents of the associated risks.

These cases illustrate examples of alternative treatment modalities which can be used for patients with double teeth. Diagnosis, treatment planning and management may involve a large multidisciplinary team for an optimum result.

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