

# Restoration of a vertical alveolar bone defect by orthodontic relocation of a mesially impacted mandibular first molar

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An impacted mandibular first molar tends to cause serious bone defects of the adjacent teeth. When choosing between the 2 typical treatment options—extraction or orthodontic relocation of the impacted tooth—the decision should be based on assessment of the prognosis. A 22-year-old man with severe mesioangulation and impaction of the mandibular first molar and a related vertical bone defect on the distal side of the second premolar was treated with extraction of the second molar and orthodontic relocation of the first molar with a retromolar mini-screw. Comprehensive orthodontic treatment involving premolar extraction was conducted. Strategic extraction of the molar and adequate orthodontic movement helped to restore the bone structure on the affected side. This case report suggests the effectiveness of restoration of bone defects by using viable periodontal tissues around the impacted tooth for the longevity of the periodontium. (*Am J Orthod Dentofacial Orthop* 2015;147:S122-32)

Impaction of permanent teeth is frequently found in adult patients. The prevalence of impaction of permanent molars excluding the third molar has been reported to be 1.8% to 9.2%.<sup>1-4</sup> Ectopic eruption of the mandibular first molar, however, is relatively rare, with prevalence rates of 0.01% to 0.36%.<sup>5,6</sup> One major etiologic factor was the mesioangular eruption path of the mandibular first molar for an unknown reason.<sup>6,7</sup> Eruption failure of mandibular posterior teeth, once it occurs, leads to complicated clinical consequences including tipping of the adjacent teeth, space loss in the dental arch, supraeruption of opposing teeth, and reduced alveolar bone height, which may necessitate not only correction of the impacted tooth but also reconstruction of the overall dentition.<sup>8,9</sup> Early detection of the impaction may be the key to prevention of those events. Impacted teeth

in adults may well have caused the majority of the complications.

There are 2 conventional treatment options for impacted teeth in adults: extraction or orthodontic relocation. Extraction is often preferred in adults mainly because of the possibility of ankylosis and the prolonged treatment time.<sup>10,11</sup> In contrast, extraction of a severely impacted molar tends to leave a serious periodontal defect at the adjacent tooth, particularly when the impacted tooth is mesially angulated.<sup>12</sup> On the other hand, orthodontic relocation of the impacted tooth may benefit the surrounding structure by bringing the bone along as the tooth erupts.<sup>13</sup> Therefore, the uncertainty of the prognosis, the risk of tooth ankylosis, and the possible periodontal defect after the extraction should be comprehensively evaluated before making the decision.

In this case report, we present an adult patient with a severely mesioangulated impaction of the mandibular first molar who was treated with orthodontic traction to induce alveolar bone formation at the bone defect of the adjacent second premolar.

## DIAGNOSIS AND ETIOLOGY

A 22-year-old man was referred to the orthodontic department of Yonsei University in Seoul, South Korea, for treatment of an impacted mandibular right first molar. His facial photographs showed a slightly convex profile with mild lip protrusion, and the maxillary and mandibular midlines were deviated 1 and 3 mm,

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All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and none were reported.

Supported by a faculty research grant of Yonsei University College of Dentistry (6-2013-0090).

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Submitted, February 2014; revised and accepted, April 2014.

0889-5406/\$36.00

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<http://dx.doi.org/10.1016/j.ajodo.2014.04.026>

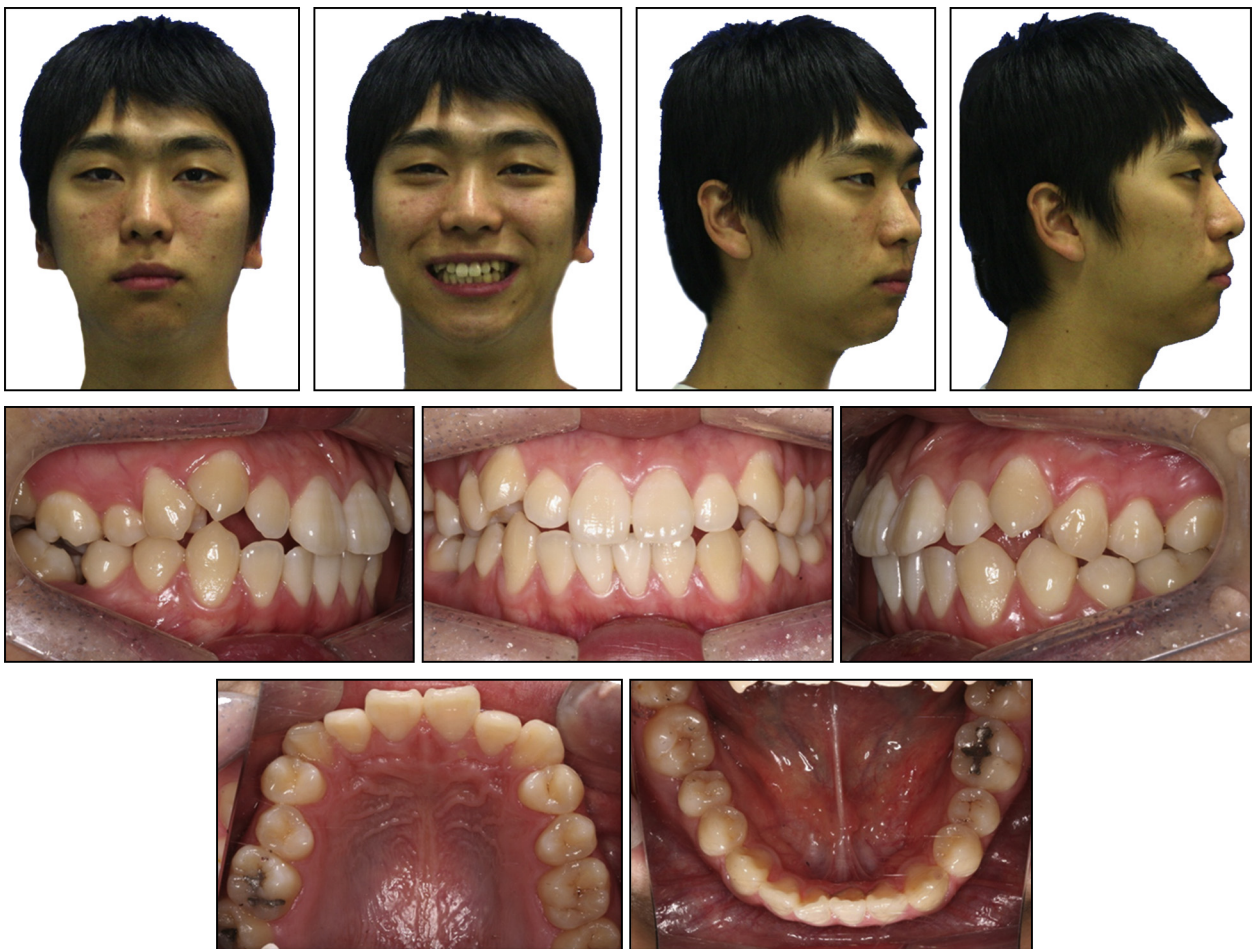


Fig 1. Pretreatment photographs.



Fig 2. Pretreatment models.

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