



CORRESPONDENCE

Alveolar distraction osteogenesis



Distraction osteogenesis of the maxillofacial skeleton is an increasingly popular alternative to many conventional

orthognathic surgical procedures. For patients with moderate to severe abnormalities of the maxillofacial skeleton,

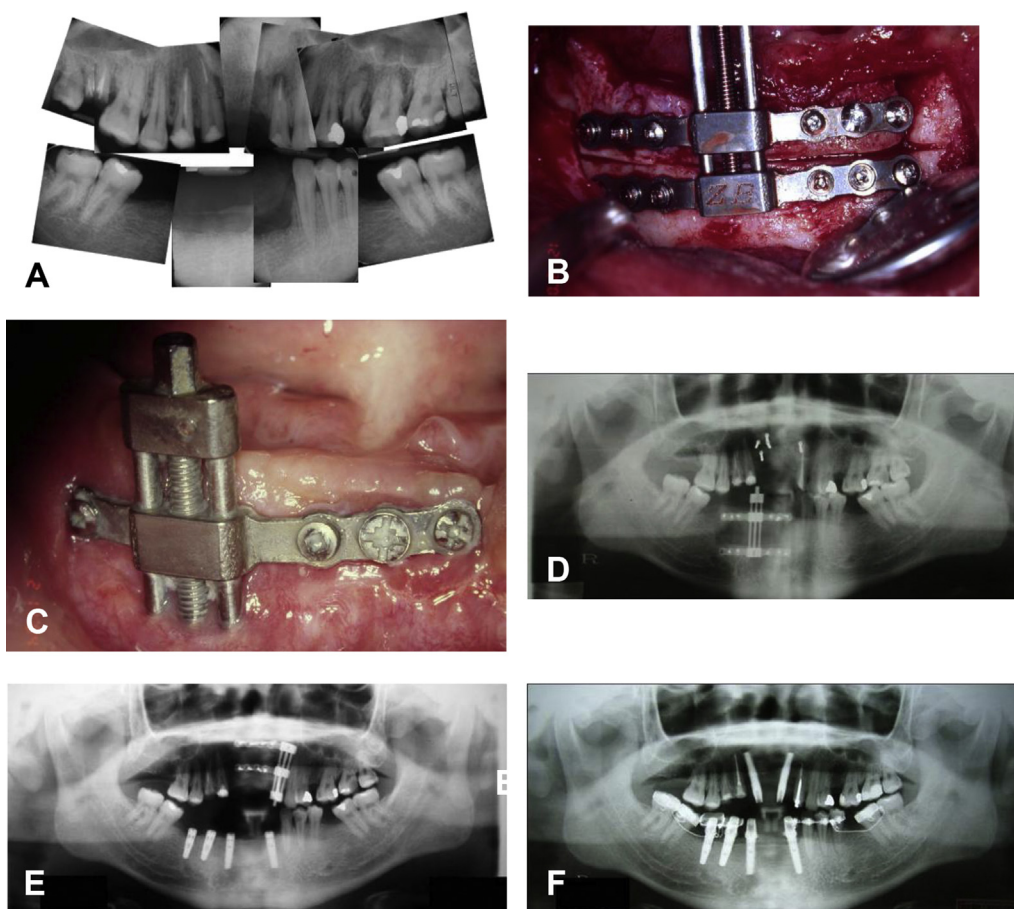


Figure 1 Clinical case of alveolar distraction osteogenesis: (A) composed periapical radiographs showing alveolar ridge defects with mild and moderate vertical alveolar ridge deficiencies in the upper and lower jaws, respectively; (B) surgical osteotomy and application of extra-alveolar distraction device; (C) the device gains vertical bone height in the mandible; (D) panoramic radiograph showing consolidation of regenerated bone in the mandible before removal of distractor and fixation screws used to fix veneer grafts of autogenous bone securely to deficient maxillary anterior ridge; (E) panoramic radiograph after removal of distractor and placement of endosseous implants in mandible and consolidation of regenerated bone in maxilla before removal of distractor; and (F) panoramic radiograph showing formation of maxillary and mandibular alveolar bones, endosseous dental implants, and orthodontic appliances for uprighting bilateral mandibular second molars into occlusion.

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distraction techniques provide additional treatment alternatives. Since the initial report of distraction of the maxillofacial skeleton by McCarthy et al¹ in 1992, successful distraction has been reported in the alveolar ridge, mandible, midface, zygomatic arch, and condylar reconstruction in the maxillofacial region.

A 23-year-old male patient presented for prosthetic reconstruction of teeth and parts of the alveolar ridges lost in a motorcycle accident 7 months earlier. Clinical and radiographic evaluation revealed alveolar ridge defects extending from the maxillary right lateral incisor to the left central incisor region and from the mandibular right second premolar to the left central incisor region (Figure 1A). The vertical dimensions of the alveolar ridge deficiencies for the upper and lower jaws were 3–4 mm and 7–8 mm, respectively. The horizontal thicknesses of the residual ridge in the upper and lower jaws were 2.0–3.0 mm and 1.8–2.0 mm, respectively.

The selection procedure for reconstructing the mandibular alveolar defect was vertical distraction osteogenesis. During the surgery, the narrow crestal portion of the alveolar ridge was resected to obtain a sufficient large surface for placement of the distraction device (Figure 1B). After a 7-day latency period, distraction was performed of a rate of 0.4 mm twice daily for 12 days. On completion of distraction, the distractor was left in place for 4 months to consolidate the regenerated bone (Figures 1C and 1D). Dental implants were initially inserted 6 months after device placement (Figure 1E). After confirming adequate osseointegration, the placements of the abutments and the temporary fixed partial denture were performed. Orthodontic treatment was performed to upright bilateral mandibular second molars into the occlusion (Figure 1F).

The maxillary anterior ridge horizontal deficiency was corrected using autogenous veneer bones harvested from the lateral ramus region and with the use of the platelet-rich plasma² and the platelet-poor plasma.³ Six months after the initial reconstruction of the vertical alveolar defect by vertical distraction osteogenesis, the placements of cylindrical endosseous implants (Figure 1F), the abutment placement, and the temporary reconstructive prosthetics were performed.

Alveolar distraction osteogenesis is now well founded in animal studies⁴ and can be considered a predictable adjunct in dentoalveolar restoration. Clinical use is usually for the placement of dental implants following vertical alveolar augmentation. In complex cases we have had to perform bone grafts or receive ridge splitting with platelet-rich fibrin⁵ augmentation to complete the width requirements of the patient. Most of the completed restorative cases were judged to have satisfactory esthetic results. As in conventional orthognathic surgery, distraction osteogenesis requires a team of various clinical specialists, including an orthodontist, an oral and maxillofacial surgeon, and/or a plastic and reconstructive surgeon. Although procedures for maxillofacial distraction osteogenesis are expected to change with advancing technology, this treatment modality is expected to be an essential part of the surgeon's and orthodontist's armamentarium for managing maxillofacial anomalies.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

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