



Mandibular Symphyseal Distraction Using a New Design Custom-Fabricated Hybrid Device

Mandibuler Simfizyel Orta Hat Distraksiyonu İçin Yeni Dizayn Edilmiş Hastaya Özel Hibrit Aperey

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Abstract

Mandibular symphyseal distraction osteogenesis represents an option for creation of intra-arch space in the mandibular arch. The aim of this paper is to introduce a simple device and method for mandibular symphyseal distraction. The presented method is a viable option for mandibular symphyseal distraction osteogenesis.

Key Words: Mandible, Distraction Osteogenesis, Oral Surgery

Özet

Mandibüler simfizyel orta hat distraksiyonu, mandibüler arkın genişletilmesi için kullanılan bir yöntemdir. Bu tekniğin sunum amacı, basit ve kolay uygulanabilir apereyi, mandibüler simfizyel distraksiyonu için tanıtmaktır. Sunulan bu yöntem mandibüler simfizyel distraksiyon osteogenezisi için kolay uygulanabilir bir yöntemdir.

Anahtar kelimeler: Mandibula, Distraksiyon Osteogenezis, Oral Cerrahi

Mandibular incisor crowding often projects a transverse bone deficiency of the mandible. Distraction osteogenesis in the symphyseal (MSDO) area widens the mandibular bone in order to increase space on the dental arch. Many kinds of distractor were used in the literature for MSDO (1,2).

In the current report, we present a new design bone-borne, tooth-borne distractor device for MSDO with severe anterior mandibular crowding and transverse mandibular deficiency cases.

A hyrax screw was used as a hybrid device. The end of lower arms of the hyrax screw was bent to form a loop to allow attachment of the screws. Two loops were formed lower part of the hyrax and one screw hole was done each side of the hyrax arms. Upper arms of the hyrax were extended to the right to left second premolars and fitted them to the buccal sides of these teeth. (Figure 1) To prepare the acrylic part of the distractor, self-curing acrylic resin was attached on both sides of the mandible and oriented according to anatomical structures of the teeth. (Figure 2) The position of the distractor was secured according to reference points, such as the contours of the teeth. In the operation, incision was made 4-6 mm labial to the depth of the vestibular sulcus through the orbicularis oris muscle. Afterwards, distraction device were applied to the mandible and the lower arms were adjusted to the bone and guidance screw holes were drilled using a Lindeman bur. A vertical osteotomy was performed in the inferior portion of the mental symphysis with a reciprocating saw, starting at the

inferior border of the mandible extending to the interdental space between the apices of the mandibular central incisors under saline irrigation. Immediately after the osteotomy, distraction device were filled with glass ionomer cement and attached to the teeth and the lower loops were fixed to the mandibular symphysis with intermaxillary fixation screws, then the distraction device was activated 2 mm to confirm the osteotomy was complete and the distraction device was returned to its initial position. (Figure 3)

Multiple distraction devices are introduced in the literature for MSDO (2). Bone-borne, tooth-borne, and hybrid distraction devices are options for MSDO (3). These distractors have three crucial roles in the treatment. The first, stability of the distraction gap should be secured by distractors. If stability is not achieved, focal haemorrhaging and cartilage interposition may be occurred within the regenerate bone. Furthermore, inadequate stabilization leads to poor vascularization of the callus and subsequently to a slower healing process. The second performance parameter is the reliability with which the appliance transfers expansion to the mandibular bone (4). The third role of the distractor is protective property. Distractor should avoid any periodontal damage to the teeth when force applied.

On the light of these findings, our new design mandibular symphyseal distractor may effective especially in periodontally unhealthy patients. Acrylic cover of the distractor protects and stabilizes the anterior teeth, and when the activation

period, forces applied equally to the teeth. It also reduce the periodontal damage, gingival recession to the mandibular anterior teeth when the distraction period.

The advantages of this new device may be summarized as follows:

1. Especially in periodontally unhealthy patients, it protects the anterior teeth and applies the forces equally,
2. During distraction, the hybrid distractor effected more parallel expansion of basal and alveolar bone than did the tooth-borne distractor,
3. The device is cheap and can be easily applied in an office setting.

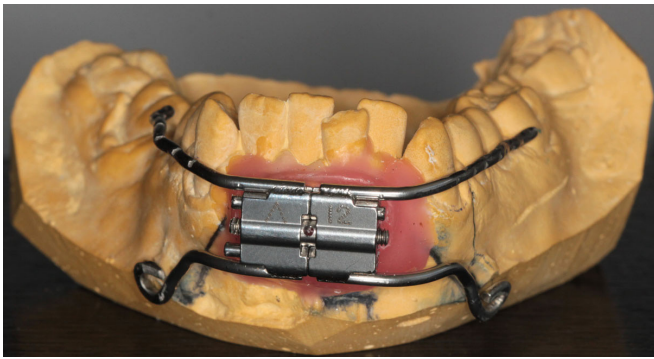


Figure 1. Upper arms of the hyrax were extended to the right to left second premolars and fitted them to the buccal sides of these teeth.

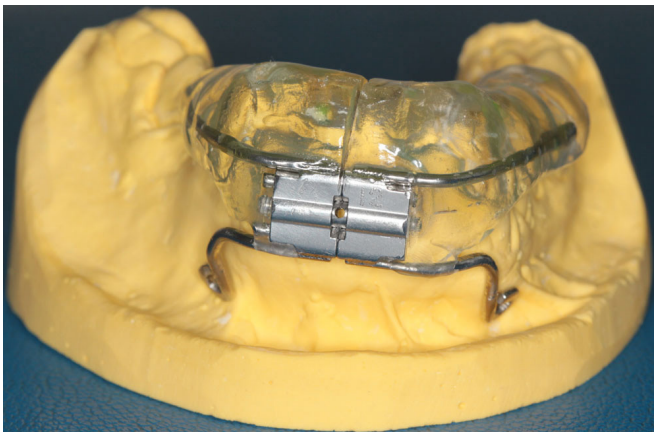


Figure 2. To prepare the acrylic part of the distractor, self-curing acrylic resin was attached on both sides of the mandible.

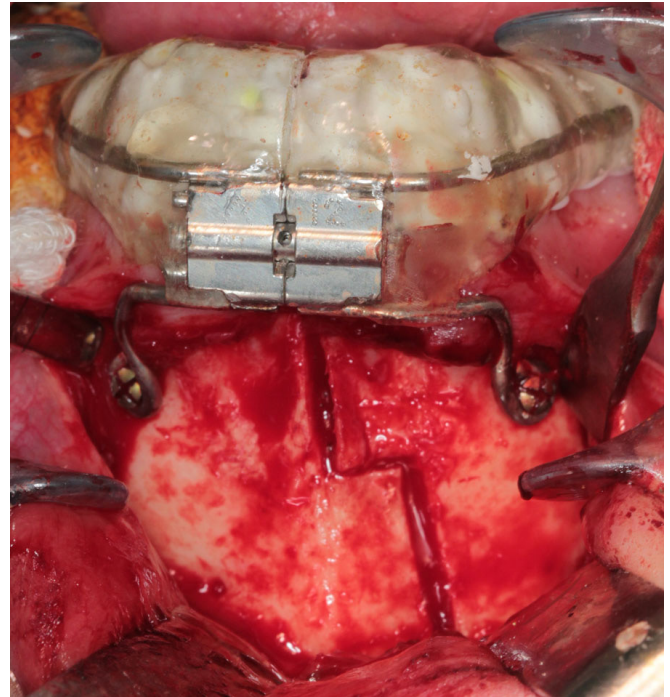


Figure 3. Distraction device were filled with glass ionomer cement and attached to the teeth and the lower loops were fixed to the mandibular symphysis with intermaxillary fixation screws.

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