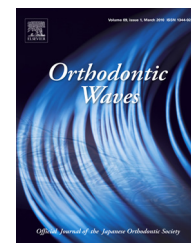


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## Case report

# Skeletal open bite corrective treatment using temporary skeletal anchorage devices of miniplates and miniscrews

Tamami Shino<sup>a,\*</sup>, Kenichi Yatabe<sup>b</sup>, Yoko Yokoyama<sup>c</sup>

<sup>a</sup> Inage Dental Clinic, 3-15-7 Inagehigashi, Inage-ku, Chiba 263-0031, Japan

<sup>b</sup> Yatabe Orthodontic Clinic, 3-1-2 Chiba-shi, Asumigaoka, Chiba 267-0066, Japan

<sup>c</sup> Oonishi Dental Clinic, 1-4-15 Motomachi Kiyoseshi, Tokyo 204-0021, Japan

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## ABSTRACT

Skeletal open-bite cases are considered difficult to treat. Since open bite generally occurs with vertical overgrowth of the maxilla or mandible, temporary skeletal anchorage devices has been used for intrusion of the molar region recently. Also distalization of all molars has become possible. En-masse molar distalization (EMD) is effective for open bite as extrusion can be avoided. The use of temporary skeletal anchorage in extraction cases, or distal movement of one side of the jaw has been reported.

We would like to report one case of skeletal open bite using miniplates on the maxilla, miniscrews on the mandible and EMD. Results were esthetically and functionally satisfying without molar extraction.

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## 1. Introduction

Skeletal open-bite is considered difficult to treat as post-treatment regression easily occurs, and extrusion of the anterior teeth often results. Conventionally, surgical correction and a multi-loop edgewise archwire (MEAW) technique are used, but the anterior teeth extrusion often occurs [1]. Skeletal open-bite causes vertical overgrowth of maxilla or mandible, hence intrusion of the molars using miniscrews and miniplates as the absolute fixed source have begun to be used [2]. In this case, distalization was carried out with intrusion of the molars using miniplates on the maxilla at the zygomatic buttresses, and miniscrews on the backspace of the second molar between the external and internal ablique line. We

choose miniplates for the maxilla since distalization was predicted to be large and the point of action of the force of all the maxillary teeth is difficult to control during distalization due to limited space for miniscrews placement on the maxilla. Miniscrews were selected for the back space of the external and internal ablique line for distalization of the mandible, extensive treatment by miniplates were not required. An anchorage unit is sometimes used as an appliance for the palate [3], but use of miniplates has a simple design and has less discomfort [4].

### 1.1. History and diagnosis

The patient was a 30-year and 4-month-old woman with an open bite. No significant information regarding family or

\* Corresponding author. Fax: +81 43 241 8881.

E-mail address: [tamamiortho@yahoo.co.jp](mailto:tamamiortho@yahoo.co.jp) (T. Shino).

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**Fig. 1 – Facial photographs. (A) pretreatment (29 years and 0 months old). (B) Posttreatment (30 years and 5 months old). (C) Three-year follow-up (33 years and 3 months old).**

medical history was reported. Facial findings showed a basically symmetrical face and a convex facial profile (Fig. 1A). Intraoral findings showed Angle Class II relationship and crowding with an arch length discrepancy of about  $-10$  mm in the mandibular anterior teeth, and  $-5$  mm in the maxillary anterior teeth. Overjet was  $+7.0$  mm, overbite was  $-3.0$  mm (Figs. 2A and 3A). Moreover, the left incisor had history of injury, was deactivated and discolored. Tongue thrust was present as a functional problem. In the cephalogram, skeletal findings included ANB:  $7^\circ$ , lower facial height:  $50^\circ$ , McNamara analysis: (A):  $+4.0$  mm (Pog):  $-10.0$  mm, WITS analysis:  $+4.0$  mm, overgrowth of maxilla. The incisor-mandibular plane angle (IMPA) was  $117^\circ$  with an interincisor angle of  $88^\circ$  (Table 1). The panoramic radiograph showed that the third molar teeth were located on the left and right sides, upper and lower (Fig. 4A).

Although flattening of the head of the mandible could be observed as a symptom of the jaw joint, the patient did not show any subjective symptoms.

### 1.2. Treatment plan and progress

Treatment by extraction of the first premolar tooth is the primary choice in conventional methods. But we planned treatment by distalization of all the jaw teeth using the extraction space of the third molar at the patient's request. And this method has the advantages for the space of the tongue, and for protecting of the temporomandibular joint. Super Mini Anchor plate (SMAP<sup>®</sup>; Y-S-L, Y-S-R, Dentsply-Sankin, Tokyo) were used for anchorage of the maxilla (Figs. 4B and 5B), and Dual Top auto screw III JA (DTA<sup>®</sup>; Jeil Medical Corporation, Korea, diameter 1.6 mm;

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