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Extraction or nonextraction: Orthodontic treatment for the complete impaction of second permanent molars

KEYWORDS

Second molar;
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The full bony impaction of the second molars (FBISM) is a rare condition with a complex etiology. FBISM may be associated with autosomal genetic traits, primary or mechanical failure of eruption, iatrogenic reasons, or lack of retromolar space.^{1–3} The elongation of antagonists, resorption or caries-related destruction of the first molars, and periodontal destruction of adjacent teeth may occur in patients with FBISM. The incidence rate of FBISM is low at approximately 1.36%–2.3% worldwide and only 0.65% in Taiwan.^{1,2} The selection of a suitable treatment strategy for FBISM is challenging for clinicians.

Herein, we presented a case of a 20-year-old female patient with the chief complaint of bilateral upper and lower second molar impaction. Clinical findings revealed mild bimaxillary protrusion, mild crowding, bilateral lower second and third molar bony horizontal impaction, and bilateral upper second molar bony mesially angulated impaction (Fig. 1a, b, c and d). We adopted a nonextraction orthodontic treatment strategy involving the extraction of teeth 38 and 48 and uprighting of all 4 s molars. Before treatment, teeth 38 and 48 were extracted. After 11 months, dental buttons were directly attached to the distal surfaces of the second molars. Lingual holding and transpalatal arches with extending hooks were then installed to facilitate the traction of the second molars toward the occlusal plane by using a power chain (Fig. 1g). After the emergence of the crowns of

teeth 17, 27, 37, and 47 from the gingiva, we bonded single tubes to their buccal surfaces. Subsequently, we ensured proper teeth leveling and alignment by using 0.014, 0.016, and 0.16 × 0.022 nickel–titanium wires. Finally, the second molars were uprighted using uprighting loops. The total treatment duration was 4 years and 3 months.

Given that the orthodontic correction of FBISM is challenging and time-consuming, an alternative treatment strategy has been proposed; this strategy involves the extraction of all four impacted lower second molars and the implantation of prosthetic teeth in the edentulous space formed due to the extraction of teeth 37 and 47. Nonetheless, we uprighted and repositioned the lower second molars because of the advantages of this strategy over the extraction of these teeth. These advantages include the avoidance of possible major procedures, guided bone regeneration, and tooth implantation.⁴ Moreover, the natural teeth of the patients can be preserved. Our experience indicates that FBISM may develop at a gingival position following the extraction of the impacted third molars. This facilitates further bonding. Once a tube is bonded to an impacted tooth, the main wire can be attached to it to start leveling and uprighting the tooth. Notwithstanding the complex and technique-sensitive strategy, through careful evaluation and precise treatment, FBISM may be treated successfully with suitable orthodontic mechanics.

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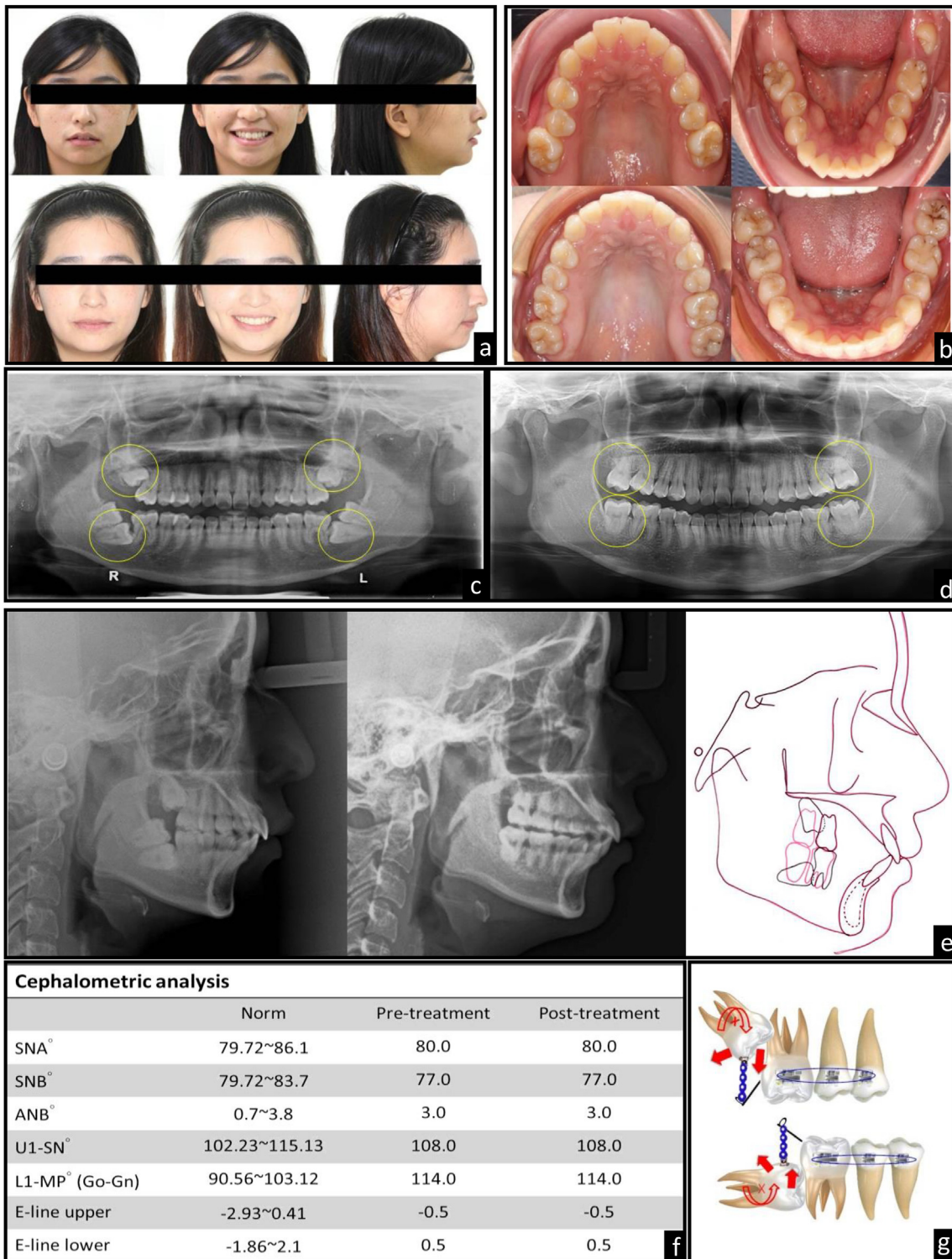


Figure 1 Clinical photographs and lateral cephalogram of our patient. (a) Pre- and post-treatment extraoral photographs. (b) Pre- and post-treatment intraoral photographs. All 4 s molars were repositioned. (c) Pretreatment panoramic radiograph. (d) Post-treatment panoramic radiograph. All 4 s molars were uprighted successfully. (e) Pre- and post-treatment lateral cephalograms. (f) Pre- and post-treatment lateral cephalometric analyses. (g) Schematic of the traction of the impacted second molars.

Declaration of competing interest

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

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