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Case report

Surgical extrusion of completely impacted mandibular second molars: A technical case report with 3 years clinical and radiographic follow-up

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ABSTRACT

Impaction of permanent teeth is a relatively common occurrence that requires treatment to allow occlusal recovery, prevent pericoronitis, and decrease the risk of caries and periodontal disease. We report the case of a 32-year-old Japanese woman presenting with missing first and completely impacted second and third mandibular molars. The patient refused to undergo any prolonged orthodontic therapy; therefore, surgical extrusion of the impacted second mandibular molar was considered as the treatment measure. Follow-up examination 3 years after surgery revealed no radiographic or clinical signs of root resorption, marginal bone loss, or periodontal disease, and the extruded second molar was found to be stable with good occlusion. The favorable results observed in this case suggest that one-step surgical extrusion is an alternative treatment option for completely impacted mandibular second molars.

1. Introduction

Impaction of permanent teeth is a relatively common occurrence in the dental arch. The incidence of impaction is highest among mandibular and maxillary third molars, followed by maxillary canines and mandibular second molars [1–4]. The etiology of an impaction can involve systemic, local, and periodontal factors, as well as developmental disruptions of the tooth germ. The most common causes of second molar impaction include ectopic positioning of the follicle, obstacles in the path of eruption, and failure of the eruption mechanism [2,3].

Dentists often have difficulty deciding the treatment modality for completely impacted mandibular second molars. There are several methods of treating impacted second mandibular molars. A possible solution 1is orthodontic therapy including uprighting springs, nickel titanium coil springs, and mini-implants [1,4,5]. However, patients sometimes refuse orthodontic therapy because of the time and expense involved. This is a technical case report on the extrusion of a completely impacted second mandibular molar that was accomplished using a surgical approach rather than orthodontic therapy.

2. Case report

A 32-year-old Japanese woman was referred to the Oral Medicine Department at Hokkaido University Hospital for treatment of a missing mandibular left first molar, which had been extracted owing to caries at a private clinic 4 months before referral. Her past medical history was uneventful. Intraoral examination revealed missing first, second, and third mandibular molars on the left side. Radiological examination revealed that the second and third molars were impacted and that the third molar was interfering with the eruption of the second molar (Fig. 1a, b). We first recommended orthodontic therapy for uprighting the impacted second molar to the missing site in the mandible, which the patient refused. Therefore, we suggested surgical extrusion for uprighting and repositioning the impacted second molar in the alveolar bone. The patient consented to this treatment, and surgery was performed with the patient under intravenous anesthesia with propofol. During surgery, the second molar was surgically extracted, fixed to the proximal tooth, and stabilized for 1 month (Fig. 2a, b). Root canal treatment was started by an endodontist (Fig. 2c, d) after 2 weeks. The mandibular left third molar was extracted, and the extruded tooth was finally repaired with a bridge 3 months later (Fig. 3a). The 3-year

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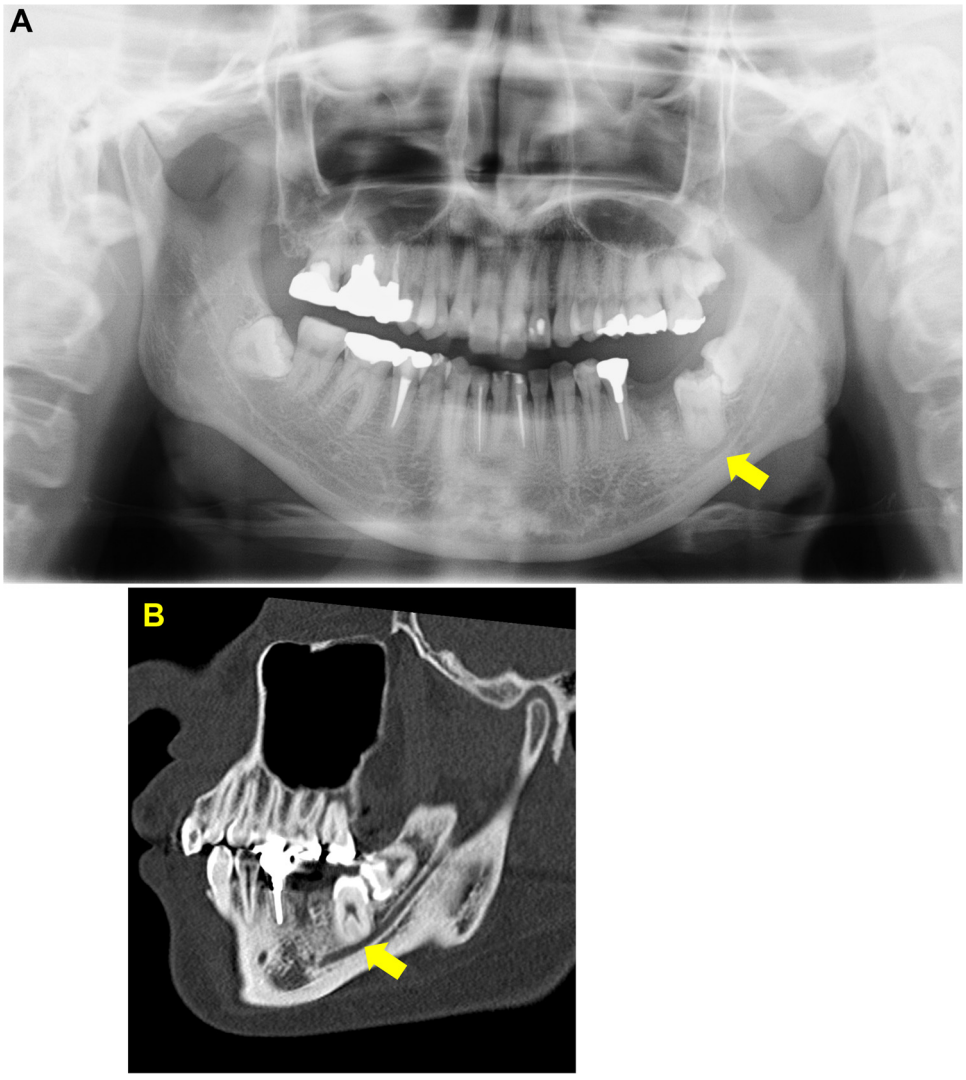

Fig. 1. Preoperative clinical and imaging findings.
A: Preoperative panoramic radiograph of impacted mandibular left second molar. The mandibular left first molar had been extracted at a private dental clinic because of dental caries.
B: Preoperative computed tomography image of impacted mandibular left second molar.

follow-up examination found no radiographic or clinical signs of root resorption, marginal bone loss, or periodontal disease, and the extruded second molar was found to be stable with good occlusion (Fig. 3b, c).

3. Discussion

The treatment of impacted mandibular second molars allows occlusal recovery, prevents pericoronitis, and decreases the risk of caries, periodontal disease, and cystic development of the follicle. Possible treatment modalities include full-mouth orthodontic therapy (with or without the removal of mandibular third molars) or surgical repositioning of mandibular second molars [1,4]. Other treatment options for such cases include partial orthodontic therapy to only upright the impacted mandibular teeth, autotransplantation of wisdom tooth after extraction of the second mandibular molar, implant therapy for missing first molars, and extraction only of the second and third mandibular molars [2]. Orthodontic-assisted tooth eruption would most likely present the best predictable outcome and could be achieved using biomechanical techniques. However, because the patient in this case strongly refused orthodontic therapy, surgical extrusion was selected as the treatment of choice.

After intraoral examination and measurement of the dental gypsum model and CT imaging, the mesiodistal and buccolingual widths of the recipient bone site for the donor teeth were very short. Therefore, we considered autotransplantation of the right mandibular and left maxillary third molar to the left mandibular molar part a second, better option. A tooth was more likely to adapt to an alveolar socket tightly in surgical extrusion. In addition, the surgical extrusion of the second mandibular tooth was thought to cause lesser surgical stress than autotransplantation. Accordingly, we decided to save the mandibular left