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Transantral apicoectomy for radicular cyst of maxillary molar following downfracture in Le Fort I osteotomy

KEYWORDS

Downfracture;
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Transantral
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Commonly, oral and maxillofacial surgeons encounter radicular cysts. Apicoectomy can be performed easily for radicular cysts of incisors, canines, and premolars. However, radicular cysts of molars have technical difficulty of apicoectomy due to poor visualization, and molars may result in extraction. Therefore, endoscopic apicoectomy has been applied for the preservation of the molars.^{1–3}

Le Fort I osteotomy is common maxillary orthognathic surgery for patients with dentofacial deformity, and maxillary segment is fixed with internal fixation using 4-hole L-shaped miniplates and screws at the piriform aperture and the zygomaticomaxillary buttress. Typically, there are two fixation holes above and below the osteotomy in each bone plate, for placement of four screws. Because conventional and endoscopic apicoectomy are required to remove the alveolar bone and lateral wall of the maxillary sinus for access to radicular cysts of maxillary molars, plate fixation at the zygomaticomaxillary buttress may be very

difficult. Therefore, we reported transantral apicoectomy for the radicular cyst of the maxillary molar following downfracture in Le Fort I osteotomy.

A 26-year-old woman with dentofacial deformity was referred to our department. Panoramic radiograph showed radicular cysts of the right maxillary first and second molars and left maxillary second premolar and first molar (Fig. 1). To preserve teeth with radicular cysts, endodontic treatment was performed before preoperative orthodontic treatment. Bilateral maxillary lateral incisors, left maxillary second molar, and right mandibular second molar were removed for poor conditions, and intraoperative transantral apicoectomy was planned. After preoperative orthodontic treatment (Fig. 1B), the patient underwent Le Fort I osteotomy and bilateral sagittal split osteotomy under general anesthesia. After downfracture of the maxilla, transantral apicoectomy with root-end preparation with a piezoelectric surgical device (Piezosurgery with OP5 tip, Mectron, Italy) and root-end filling with SuperEBA cement was performed for the right maxillary first and second molars and left maxillary second premolar and first molar (Fig. 1C–G). The postoperative course was uneventful, and postoperative orthodontic treatment was performed. Bimaxillary plates and screws were removed 1 year after orthognathic surgery. Panoramic radiograph 2 years after orthognathic surgery showed good bone healing after transantral apicoectomy (Fig. 1H).

Treatment of molar radicular cysts is challenging, and many molars may be removed if endodontic treatment is unsuccessful. Conventional apicoectomy of molars is not

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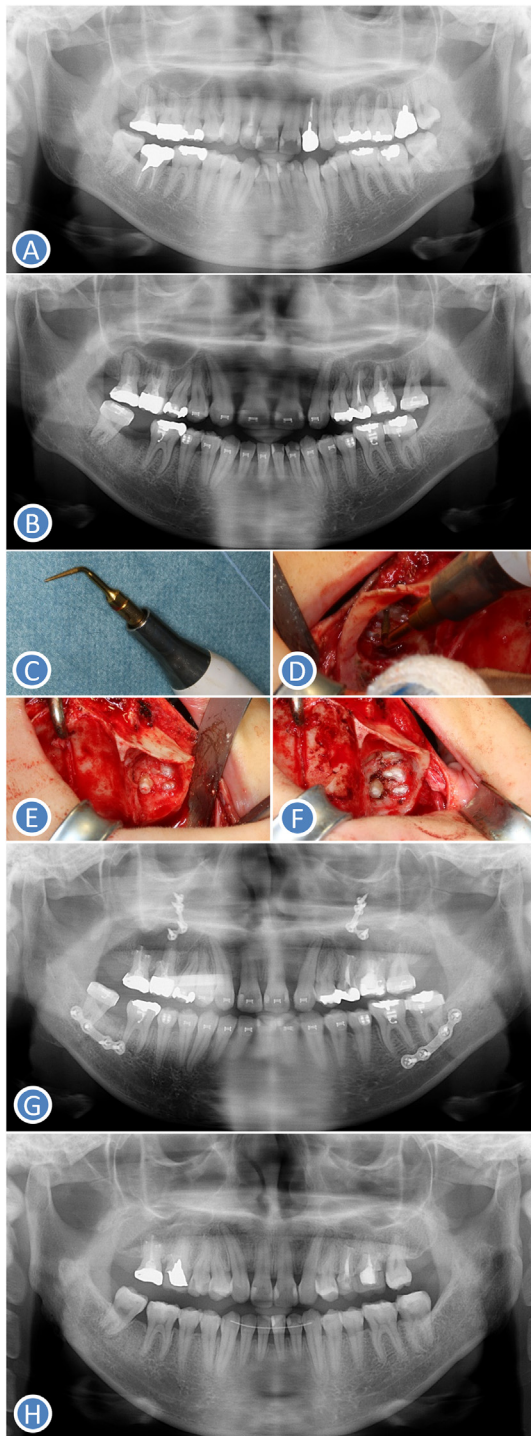


Figure 1 (A) Panoramic radiograph at the initial visit, (B) Preoperative panoramic radiograph, (C) Piezoelectric surgical device (Piezosurgery with OP5 tip), (D) Intraoperative view (Root-end preparation with piezosurgery of the left maxillary second premolar and first molar), (E) Intraoperative view (Root-end preparation with piezosurgery of the right maxillary first and second molars), (F) Intraoperative view (Root-end filling of the right maxillary first and second molars), (G) Panoramic radiograph immediate after orthognathic surgery, (H) Panoramic radiograph 2 years after orthognathic surgery.

always performed because of the technical difficulties and poor visualization. Therefore, endoscopic apicoectomy has been introduced to avoid the removal of molars.^{1–3} However, even an endoscopic approach requires bone removal of the lateral wall of the maxillary sinus. When patients with dentofacial deformity have large radicular cysts of maxillary molars which cannot be healed by endodontic treatment, application of endoscopic apicoectomy may provide insufficient plate fixation for bone removal. In contrast, transantral apicoectomy for radicular cyst of the maxillary molar after downfracture in Le Fort I osteotomy enables preservation of the compromised molar and sufficient plate fixation of the maxilla. Although conventional or endoscopic apicoectomy is performed with an ultrasonic retrograde tip, transantral apicoectomy requires an ultrasonic straight tip for the height of the maxillary sinus wall.

Conflict of interest

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

References

1. von Arx T, Gerber C, Hardt N. Periradicular surgery of molars: a prospective clinical study with a one-year follow-up. *Int Endod J* 2001;34:520–5.
2. von Arx T. Frequency and type of canal isthmuses in first molars detected by endoscopic inspection during periradicular surgery. *Int Endod J* 2005;38:160–8.
3. Iwai T, Tamai N, Matsui Y, Tohrai I. Use of in-house, full-colour printed three-dimensional model for training in endoscopic periradicular surgery for molar radicular cyst. *Br J Oral Maxillofac Surg* 2012;50:e41–2.

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