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Surgical management of recurrent apical abscess and root defect in a vital premolar caused by intermaxillary fixation screw placement



KEYWORDS

Intermaxillary fixation screw;
Complications;
Root injury;
Apical abscess

Intermaxillary fixation screw (IFS) has become increasingly popular in the treatment of maxillofacial trauma for fracture reduction and immobilization.^{1,2} There is a potential risk of iatrogenic root injuries when inserting screws into the interdental space between adjacent teeth.^{3–5} This paper presented a case of a patient who experienced recurrent apical abscess in the maxillary second premolar with preserved pulp vitality, resulting from root damage caused by IFS.

A 33-year-old male patient presented with a chief complaint of recurrent swelling of mucosa in the apical region of tooth #25 for over ten years. Thirteen years ago, the patient underwent mandibular fracture reduction surgery in the left lower jaw, which involved the insertion of an IFS between teeth #25 and #26. Several weeks following the surgery, recurrent swelling of mucosa developed in the apical region of tooth #25. The patient sought treatment at a dental clinic where tooth #25 was diagnosed with necrotic pulp and apical abscess, and nonsurgical root canal treatment was recommended. However, the treatment was discontinued due to tooth pain experienced during access cavity preparation. The access cavity was then filled with composite resin, and the patient was referred to our clinic. Fig. 1 showed intraoral photographs and radiological

images. Periodontal probing revealed measurements within normal limits. The tooth was sensitive to percussion and palpation in the apical region but responded normally to pulp cold and electric tests. Tooth #25 was diagnosed with normal pulp and apical abscess. Nonsurgical endodontic treatment was contraindicated due to the pulp vitality, and surgical intervention was proposed. The patient provided written informed consent before proceeding with the treatment.

Under local infiltration anesthesia, a triangular mucoperiosteal flap was elevated. The lesion, located distobuccally around the apical third curvature of tooth #25, was exposed, and a curette was used to remove the pus and granulation tissue. The root defect was identified and gently cleaned using an ultrasonic working tip, with no evidence of perforation or communication with the root canal observed under a dental operating microscope. To fill the root defect, a commercial bioceramic root repair material was used. The surgical flap was then sutured closed, and a postoperative radiograph was taken. After one week, the sutures were removed, and the symptoms of apical abscess and swelling resolved. At 24-month follow-up examinations, tooth #25 remained asymptomatic and responded normally to pulp cold and electric tests.

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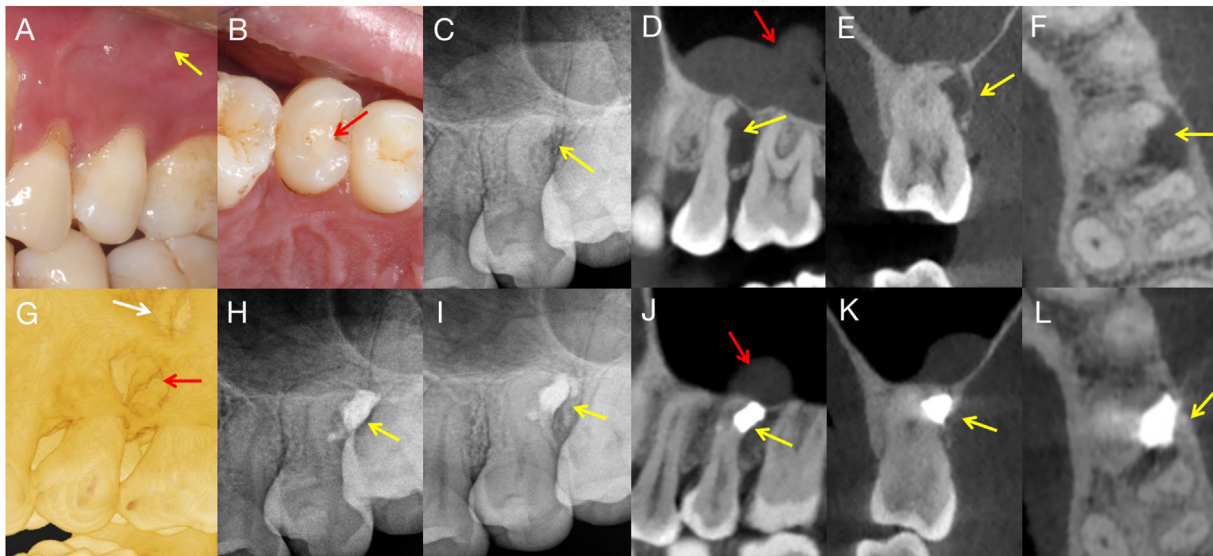


Figure 1 Intraoral photographs and radiological images. (A) Intraoral examination showed swelling of the mucosa in the apical region of tooth #25 (yellow arrow); (B) Tooth #25 had a composite resin restoration without visible cracks or caries (red arrow); (C) Pre-operative periapical radiograph displayed normal lamina dura in the periapical area, with a region of decreased density distal to the root of tooth #25 (yellow arrow); (D) Sagittal section of cone-beam computed tomography (CBCT) image revealed the close proximity of tooth #25 to the maxillary sinus floor and significant thickening of the maxillary sinus mucosa (red arrow). A “wedge-shaped” defect was observed in the apical third curvature of the root, extending close to the root canal wall (yellow arrow); (E) Coronal section of CBCT image exhibited a radiolucent area distobuccally surrounding the root defect (yellow arrow). Buccal cortical bone disruption and fenestration were also evident (yellow arrow); (F) Axial section of CBCT image showed a radiolucent area distobuccally around the root (yellow arrow); (G) 3D reconstruction of CBCT image revealed buccal cortical bone disruption and fenestration in the middle (red arrow) and apical areas (white arrow) of tooth #25; (H) Post-operative periapical radiograph showed the presence of bioceramic root repair material (iRoot BP Plus; Innovative BioCeramix Inc, Vancouver, Canada) distally around the apical third of the root of tooth #25 (yellow arrow); (I) Periapical radiograph at the 24-month follow-up showed normal lamina dura in the apical area of tooth #25; (J–L) CBCT images at the 24-month follow-up revealed significant resolution of the radiolucent area around the root defect (yellow arrow) and the maxillary sinus mucositis (red arrow).

The incidence of root injury caused by IFS placement is not uncommon (12.5%), but adverse effects are rare.⁵ Complications can range from transient injuries with minimal consequences to more severe issues, including root perforation, loss of pulp vitality, and the development of periradicular lesions.^{4,5} Most affected teeth maintain their health, with only 3% requiring endodontic treatment.⁵ The presented case demonstrates the rare incidence of recurrent apical abscess resulting from root damage caused by IFS placement. Accurate diagnosis in such cases can be challenging. Therefore, obtaining comprehensive medical histories, along with conducting thorough clinical and radiographic examinations, is crucial for correct diagnosis and selection of the optimal treatment options.

Declaration of competing interest

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

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None.

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