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Hindrance of tooth eruption and orthodontic tooth movement by focal idiopathic osteosclerosis in the mandible



KEYWORDS

Orthodontic tooth movement;
Tooth eruption;
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Mandible

Idiopathic osteosclerosis (IO) is defined as an asymptomatic, non-expansile, radiopaque lesion in the jawbone.¹ This case report presented a rare complication of the IO which hindered tooth eruption and orthodontic tooth movement in the mandible.

This 14-year-old girl visited the Department of Pediatric Dentistry, Shuang-Ho Hospital, New Taipei City, Taiwan and asked for orthodontic treatment due to slight malalignment of teeth and impaction of tooth 34 (the left mandibular first premolar). The initial periapical radiograph showed a radiopaque lesion between teeth 33 and 34, resulting in impaction of tooth 34 (Fig. 1A). After extraction of teeth 14, 24, 35 and 45, the patient began to receive orthodontic treatment and the tooth 34 erupted to the occlusal level. However, a 2-mm space between teeth 33 and 34 persisted even after two-year orthodontic treatment (Fig. 1B). Intraoral examination revealed a smooth alveolar bone surface without expansion of both the buccal and lingual cortical plates of teeth 33 and 34 region of the mandible. There was no caries of teeth 33 and 34 and the vitality tests for both teeth were normal. Thus, the clinical diagnosis of the radiopaque lesion was focal IO. Because we suspected that the osteosclerotic bone might hinder the orthodontic tooth movement and prevent the closure of the space between teeth 33 and 34, the patient was referred to oral surgeon for removal of the IO lesion between teeth 33 and

34. The IO lesion was excised under local anesthesia and sent for histopathological examination. Microscopically, it showed trabeculae of dense lamellar bone and fibrotic marrow tissues without a chronic inflammatory cell infiltrate (Fig. 1C–E). Thus, an IO lesion was confirmed histopathologically. Five months after the surgical excision of the IO lesion, the space between teeth 33 and 34 was closed successfully by orthodontic treatment. However, the recurrence of the IO lesion was noted 5 months after surgical removal of the lesion (Fig. 1F). The IO lesion persisted 2 years (Fig. 1G) and 8 years (Fig. 1H) after surgical excision of the lesion.

The etiology of IO is unknown. The IO lesion can be diagnosed clinically by viewing the radiographs. The differential diagnosis of IO lesion should include condensing osteitis. The IO lesion is located at either the periapical or interradicular region and usually requires no treatment. It is often related to vital adjacent teeth. However, the condensing osteitis is frequently situated at the periapical region of a non-vital tooth or a tooth with chronic pulpitis.¹ When the IO lesion is excised, it can be easily confirmed by histological examination of hematoxylin and eosin-stained tissue sections without the need of immunohistochemical staining to identify the tumor or cell origin.^{2–5}

In this case, the IO lesion hindered not only the eruption of tooth 34 but also the orthodontic movement of tooth 34.

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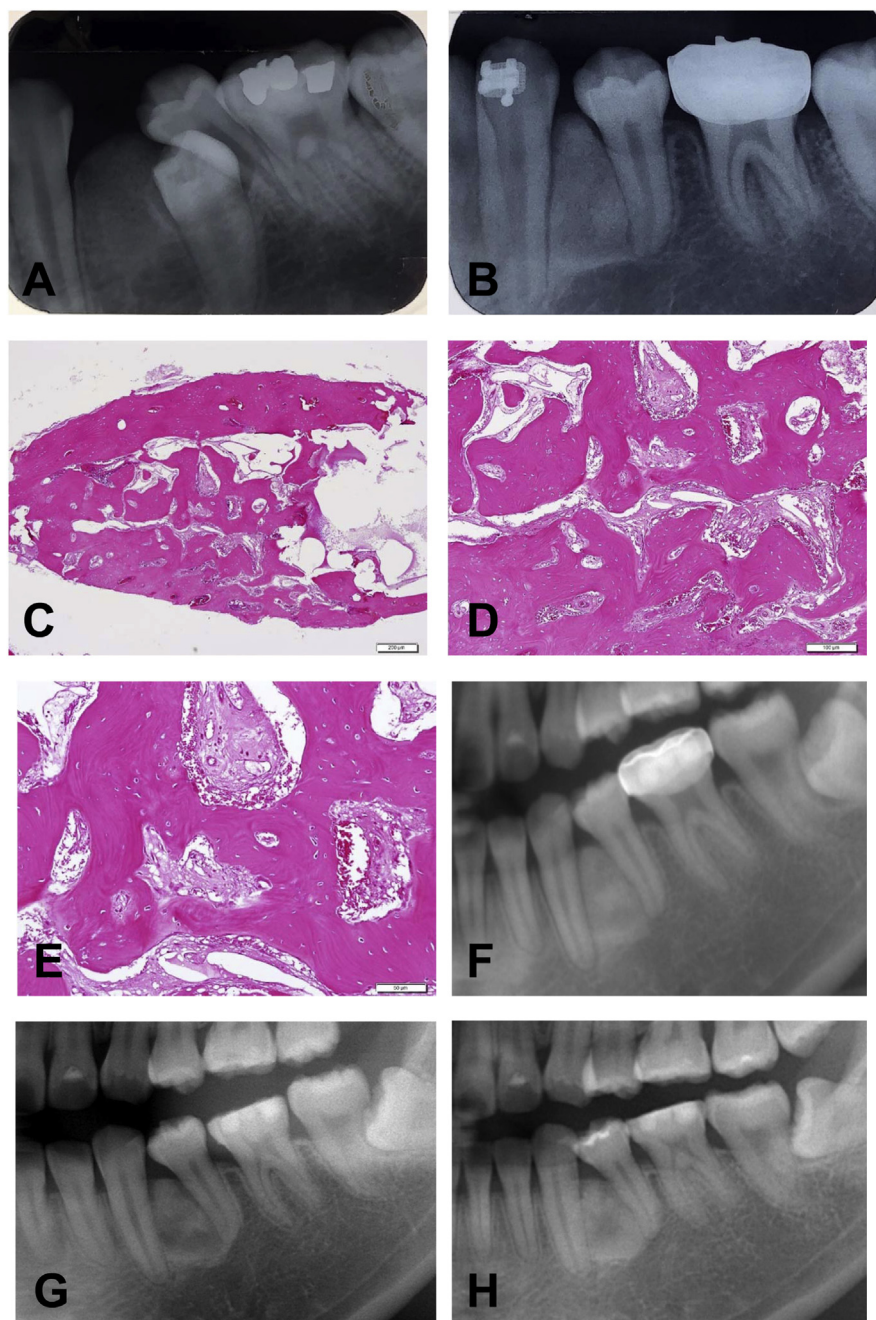


Figure 1 Periapical and panoramic radiographs and histopathological microphotographs of our case of idiopathic osteosclerosis (IO). (A) Initial periapical radiograph before the orthodontic treatment revealed an IO lesion between teeth 33 and 34 and impaction of tooth 34. (B) Periapical radiograph taken 2 years after extraction of tooth 35 and orthodontic treatment showed the persistence of the IO lesion, the eruption of tooth 34 to the occlusal level, and a 2-mm space between teeth 33 and 34. (C, D and E) Low-power (C; original magnification, 4 \times), medium-power (D; original magnification, 10 \times), and high-power microphotographs (E; original magnification, 20 \times) demonstrated trabeculae of dense lamellar bone and fibrotic marrow tissues without a chronic inflammatory cell infiltrate. (F) Panoramic radiograph showed the closure of the space between teeth 33 and 34 by orthodontic treatment and the recurrence of the IO lesion 5 months after surgical removal of the lesion. (G and H) Two-year and 8-year follow-up panoramic radiographs showed the persistence of the IO lesion 2 years (G) and 8 years (H) after surgical excision of the IO lesion.

After surgical removal of the IO lesion, although the tooth 34 could be moved to close the 2-mm space within 5 months, the IO lesion recurred 5 months later and persisted 8 years after surgical removal of the IO lesion. The dentists

should bear in mind that IO lesion may hinder both tooth eruption and orthodontic tooth movement. In addition, it may recur after surgical excision and persist for several years without remodeling.

Conflicts of interest

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

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