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Short communication

Obliteration of the pulp canal caused by mandibular distraction: a case report

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Abstract

We present a 16-year-old boy with a history of ankylosis of the temporomandibular joint (TMJ) who had been treated with a costochondral graft and mandibular distraction. The distraction seems to have caused pulp canal obliteration of the lower right second premolar and lower right first molar on radiographic examination. To our knowledge this is the only reported instance of such damage related to mandibular distraction. We aim to highlight the risks of this complication and the importance of discussing it with patients as part of the process of informed consent.

Keywords: Mandibular distraction; Pulp canal obliteration; Distraction osteogenesis

Case report

A 16-year old boy presented to the maxillofacial department for follow up one year after the removal of mandibular distractors.

He had initially presented at the age of two with ankylosis of the right temporomandibular joint (TMJ) secondary to a mastoid infection. The ankylosis was released and then treated with a costochondral graft in 2004, after which he had a class II skeletal profile and a 2 cm overjet.

At the age of 14, bilateral mandibular distractors were placed under general anaesthesia and left in situ for six months. Radiographic examination before and immediately after distraction showed a normally-developing dentition (Fig. 1). There were changes in the pulp chambers of the lower right second premolar (LR5) and lower right first molar (LR6) after one year of treatment (Fig. 2). A radiograph was taken at the most recent appointment, which showed obliterated pulp chambers, and root canals in the LR5 and LR6 (Fig. 3). The LR5 and LR6 did not respond to vitality testing, and there were no other adverse symptoms.

Discussion

Obliteration of the pulp canal is characterised by rapid deposition of mineralised tissue in the root canal space. However, if the pulp tissue cannot be seen radiographically, it does not necessarily mean that it is not visible clinically or histologically. Different factors can cause it, such as dental trauma, carious lesions, abfraction, abrasion, pulp capping, occlusal imbalance, orthodontic treatment, harmful oral habits, and individual ageing.[1–3] To the best of our knowledge, distraction osteogenesis has not yet been reported to cause it.

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Fig. 1. Orthopantomogram of mandibular distractors placed bilaterally in a 14-year-old boy. Lower right second premolar and first molar (LR5 and LR6) show normal pulp canals. No symptoms were present.

Fig. 2. Orthopantomogram after mandibular distractors were removed (after one year of treatment) and changes can be seen in lower right second premolar and first molar (LR5 and LR6). There were no symptoms in the teeth.

Fig. 3. Radiograph one year after treatment shows completely obliterated pulp canals in lower right second premolar and first molar (LR5 and LR6). These teeth were examined and showed no symptoms on percussion and pulp vitality testing.

There are many forms of distraction osteogenesis, and it is a well-established method of generating new bone. The method most commonly used in the maxillofacial community is callotasis, followed by incremental expansion to achieve the desired length of bone. A period of ceased activity allows a hard callus to form (usually over a period of about eight weeks), and then the distractors can be removed.

Distraction osteogenesis in the mandible can cause complications in the soft tissues, insufficient vector control, temporary disturbances in the inferior alveolar nerve, neurosensory issues, device-related problems, mandibular fractures, insufficient formation of bone, and fracture of the transport disc.[4] Pulp canal obliteration that is related to mandibular distraction should not be left unnoticed.

Current publications describe some common causes of pulp canal obliteration, but as far as we know there are none reported in connection with distraction osteogenesis. A number of studies have shown its development as a result of dental trauma.[5] This case highlights possible complications and sequelae that can result from distraction. A damaged tooth could have a sterile abscess that could get infected, and lead

to mobility and premature tooth loss. A review identified that up to 75% of teeth with pulp canal obliteration are asymptomatic and require no treatment other than radiographic monitoring.[6]

Conclusion

This case has highlighted an unreported risk of mandibular distraction that we think is important for consenting purposes, particularly in view of the Montgomery case,[7] (for example, if a patient places high importance on teeth that require further restorative intervention and may be lost prematurely). We plan to inform our patients of the possibility of this complication, and encourage our colleagues engaged in this type of work to do the same when appropriate.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patients' permission

Not applicable.

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