

CASE REPORT

An Unusual Ankylosis in an Orthodontic Case

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The causes of ankylosis are unclear, although factors including trauma, infection, and congenital conditions have been implicated.¹ The incidence of ankylosis is higher in deciduous teeth than in permanent teeth, and it is more frequent in Caucasians than in Asians.^{2,3}

Extensive ankylosis can be detected in dental radiographs, but ankylosis is difficult to distinguish when fusion occurs only in a small area or on the buccal or lingual surface.² Treatment methods include luxation, reimplantation, prosthetic buildup, osteocorticotomy, and extraction.^{4,5} When ankylosis appears in permanent teeth intended for orthodontic correction, however, treatment becomes more problematic.⁵

This article describes the

management of an orthodontic case complicated by atypical ankylosis.

Diagnosis and Treatment Planning

A 10-year-old girl presented with the chief complaint of anterior crowding. Examination revealed abnormal inclinations of the mandibular left lateral incisor and canine (Fig. 1). The diagnosis was bimaxillary protrusion of the mixed dentition.

Planning for the first phase of treatment included a cervical headgear to the maxilla and a lingual arch for mandibular space maintenance. The second phase involved the extraction of four first premolars and the placement of a multibracketed appliance.

Treatment Progress

The first phase of treatment appeared to progress normally, but we became concerned about the mesial inclination of the mandibular left canine, which was in deep contact with the lateral incisor (Fig. 2A). Initially, we placed an elastomeric separator between the two teeth (Fig. 2B). When this was unsuccessful, we tried to pull the canine with orthodontic elastics, then to move the teeth with an open-coil spring placed between them. All these efforts failed to produce any movement.

Although the possibility of ankylosis had not been ruled out, there was no radiographic evidence to confirm it, and ankylosis of two fully erupted, permanent teeth is rare. We therefore

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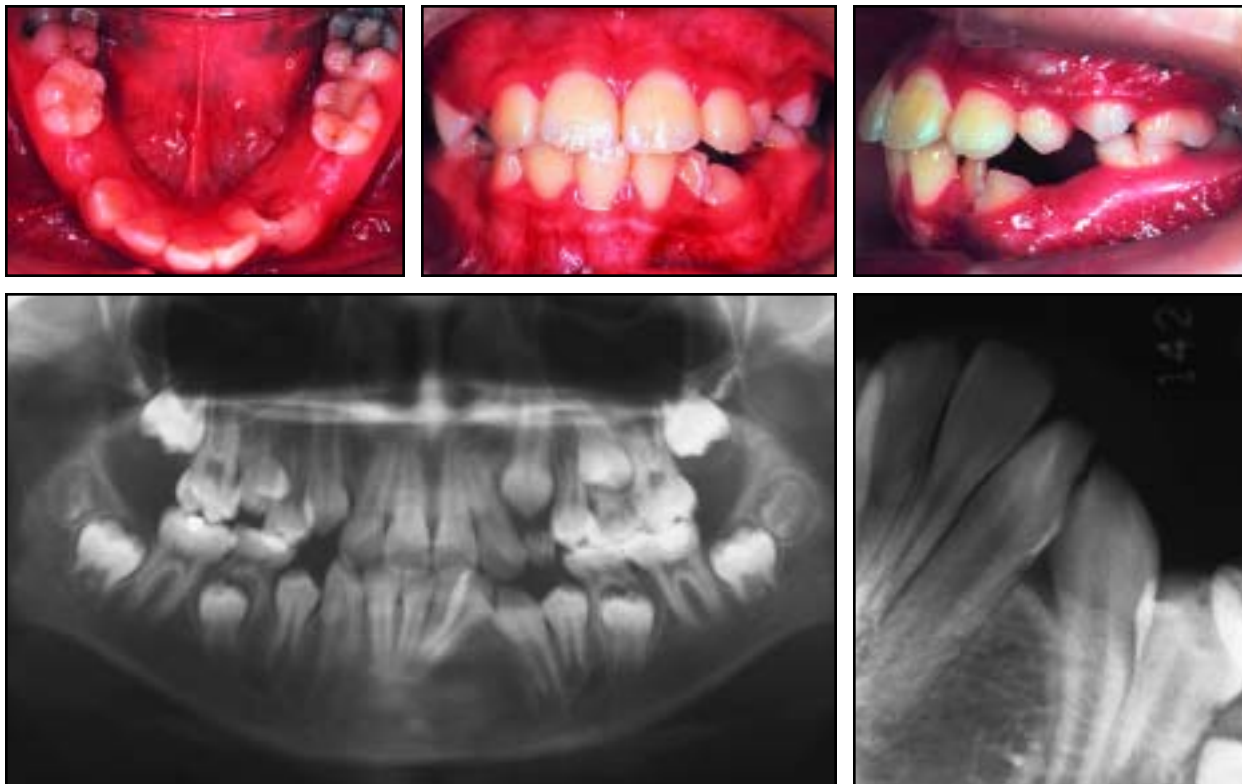


Fig. 1 10-year-old patient before treatment.

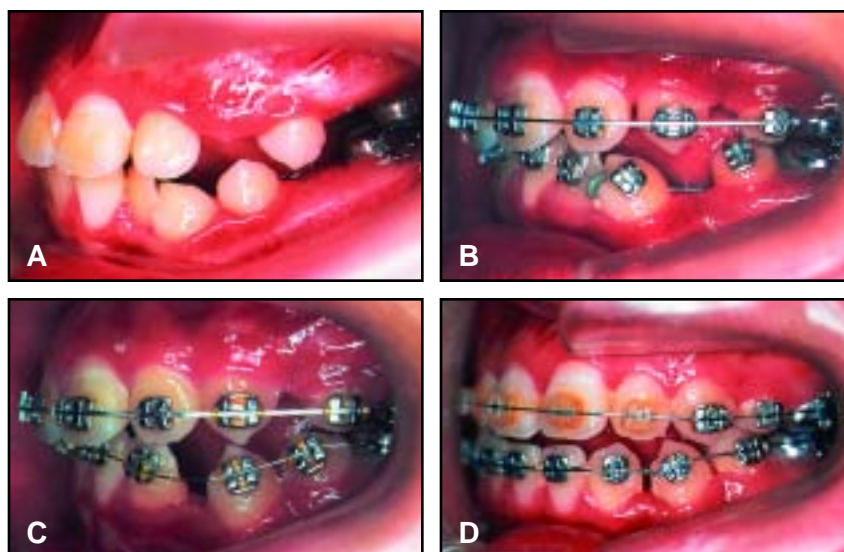


Fig. 2 A. Patient after first phase of treatment. B. Attempted separation of mandibular left lateral incisor and canine. C. After luxation of canine. D. Limited space closure after luxation.

decided to luxate the canine. If this procedure also failed, we would consider some type of surgery, such as a segmental osteotomy, but not until growth was completed.⁶

The luxation was performed one year after the start of treatment (Fig. 2C), and some movement seemed to occur (Fig. 2D). After luxation, however, we observed a radiopaque area on the x-ray, divided into two fragments on either side of the luxated zone (Fig. 3). These fragments could not be removed by supersonic scaling. On consultation, the Department of Periodontology reported the presence of an unusual cementum-like formation in the alveolar crest between the mandibular left canine and lateral incisor, which was suspected of being the remnants of ankylosed tissue.

There were two options at this point: surgical removal of the ankylosed fragments, or periodontal supervision of the area. When the alternatives were explained to the parents, they declined the surgery.

At the end of treatment, a 1mm space remaining between the canine and the incisor could

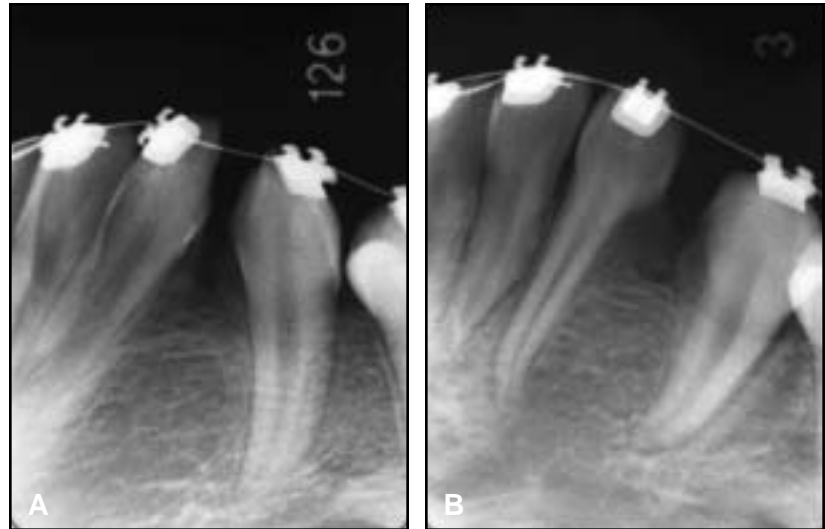


Fig. 3 A. Two months after luxation. B. Seven months after luxation.

not be closed without surgical intervention (Fig. 4). Hawley-type retainers were delivered after debonding, and no abnormal bone resorption or inflammation was observed between the incisor and canine.

Discussion

This patient did not exhibit the typical ankylosis that can be identified from retarded eruption, submergence, or radiographic evidence. Furthermore,



Fig. 4 Patient after orthodontic treatment.

the eruption of the ankylosed teeth continued from the time the patient was first seen until treatment was started (compare Figs. 1, 2A, and 2B).

Because no histological analysis was done, it is unclear whether the suspected ankylosed tissue originated in the bone or the cementum. Since the process occurred only in the alveolar crest, it was difficult to identify it from the radiographs at first examination. It was recognized clinically, however, by its lack of mobility regardless of our efforts to move it,² and was finally con-

firmed radiographically following luxation.

The treatment option we followed was based on recommended protocol,² but a general lack of information on this topic prevented us from making a greater effort to convince the parents of the need for surgery. That might have been the ideal treatment for this uncommon case of ankylosis. It would probably have enabled us to close the space and would have been less traumatic for the patient in the long run.

REFERENCES

1. Shafer, W.: *A Textbook of Oral Pathology*, 4th ed., W.B. Saunders Co., Philadelphia, 1983, pp. 540-541.
2. Albers, D.: Ankylosis of teeth in the developing dentition, *Quintess. Int.* 17:303-309, 1986.
3. Biederman, W.: The incidence and etiology of tooth ankylosis, *Am. J. Orthod.* 42:921-926, 1956.
4. Medeiros, P. and Bezerra, A.: Treatment of an ankylosed central incisor by single-tooth dento-osseous osteotomy, *Am. J. Orthod.* 112:496-501, 1997.
5. Cheng, C.; Zen, E.; and Su, C.: Surgical-orthodontic treatment of ankylosis, *J. Clin. Orthod.* 31:375-377, 1997.
6. *Contemporary Orthodontics*, ed. W.R. Proffit and H.W. Fields Jr., 2nd ed., Mosby, St. Louis, 1993, p. 218.