

Treatment of an “ankylosed” upper central incisor in the mixed dentition

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A ten-year-old boy presented with an unerupted upper right central incisor (UR1). An OPG radiograph showed a supernumerary tooth lying over its crown, preventing its eruption. Standard orthodontic treatment involving removal of the supernumerary tooth, attaching a gold chain to the UR1 and treatment with fixed orthodontic appliances failed to bring the tooth down, until it was found that tough fibrous gingival tissue entwined in the gold chain had “ankylosed” the tooth. Once this tissue had been removed and the wound packed open, the tooth was brought down successfully into occlusion.

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Introduction

Ankylosis, as it relates to human teeth, can be defined as the perforation of the periodontal tissues and the formation of an alveolar bony bridge from the surrounding bone to the tooth root, effectively locking the tooth to the bone.¹ It is thought to be brought on by a number of conditions; namely, certain endocrine or congenital disorders, such as Cleido-cranial dysostosis; periodontal trauma; infection; or by causes unknown.

Ankylosed teeth resist orthodontic movement and the natural eruption process. Impacted teeth, on the other hand, are defined as those that are prevented from natural eruption due to an obstruction, such as being entrapped by abutting teeth, or by the impenetrable fibrous tissue that is often found in the palate.

Diagnosis

The patient was a healthy ten-year-old, white Caucasian boy. He had a Class I skeletal and dental malocclusion, with negligible crowding in the mixed dentition. The upper right central incisor (UR1) had failed to erupt and an OPG radiograph showed a supernumerary tooth lying over its crown (Figure 4). The abutting teeth had partially drifted mesially into the UR1 space (Figures 1a, b and c; 2a, b and c; and 3a, b and c).

Original treatment plan, method and results

The original treatment plan was to i) surgically expose and remove the supernumerary tooth (Figure 5); ii) concurrently, surgically expose the crown of the UR1 and attach an orthodontic gold chain to it; and iii) fit fixed Edgewise orthodontic appliances to the maxillary dentition, regain the space for the UR1, and move the UR1 down



Figures 2a, b and c. Pretreatment photographic records.

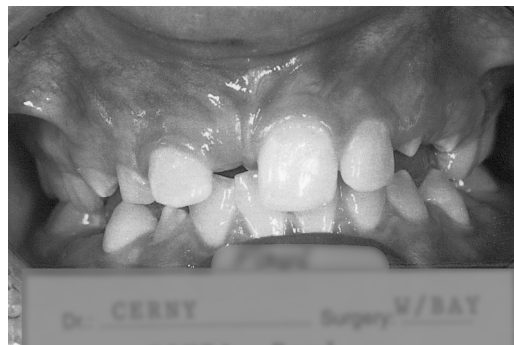


Figure 2b.



Figures 1a, b and c. Pretreatment facial photographs.

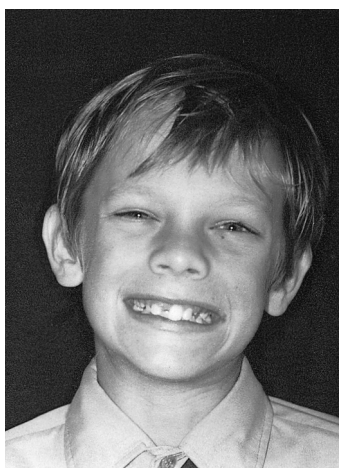


Figure 1b.



Figure 1c.

into the occlusion using appropriate orthodontic traction mechanisms, including bilateral auxiliary wire whips.

After seven months of careful and varied orthodontic traction mechanisms, the UR1 did not come down; instead the abutment teeth began to intrude. This was a highly unusual and unexpected response as the radiographs showed that the root of the UR1 appeared to be straight and without an apical hook, and it was unlikely that the tooth would have been ankylosed in such a young, healthy boy. It was thought that the attachment on the crown may have been too bulky and that it had become ensnared in the gingival fibrous tissue.

New treatment method and results

After a long discussion with the patient and his parents, the following treatment was undertaken:

The UR1 crown was re-exposed, using a broad buccal flap (Figure 7). This procedure showed that the gold chain attachment to the tooth was small and innocuous. The gingival tissues, however, were extremely tough and entwined in the gold chain, and proved very difficult to remove.

Once this was done, the gold chain was covered with fast-setting cold-cure acrylic to keep the fibrous gingival tissues from re-entwining, and the wound was packed open with gutta percha. The gingival flap was left open. The bilateral auxiliary orthodontic wire whips were re-attached to the UR1, and within two months the tooth had moved down enough to be visible in the mouth (Figure 8). Over the following few months, the tooth's movement into the occlusion proceeded normally (Figures 9, 10, 11 and 12).



Figure 2c.

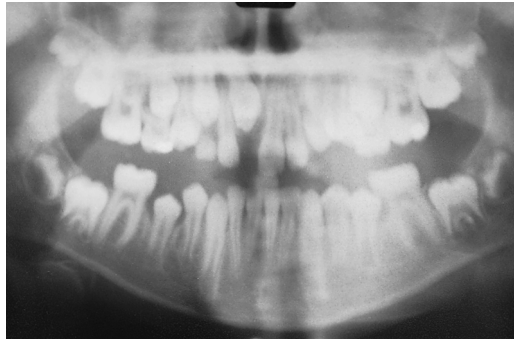


Figure 4. Pretreatment OPG radiograph.



Figure 5. The supernumerary tooth.



Figures 3a. Pretreatment.

Conclusion

The tough fibrous gingival tissue covering the tooth and entangled around the gold chain is credited with the reason for the failure to move this tooth orthodontically. The author is sure that this problem has occurred several times before in other impaction cases he has treated. The use of an open-packed channel exposure technique is recommended as a way of avoiding similar occurrences, also having the advantage that it facilitates an easier orthodontic movement of such impacted teeth into the occlusion.

Reference

1. Graber TM, Orthodontics: Principles and practice. 3rd edn. Saunders WB & Co., 1972: 391-2.

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Figure 3b.



Figure 3c.



Figure 6. Post-exposure of the UR1. Edgewise fixed appliances fitted (18.6.98).

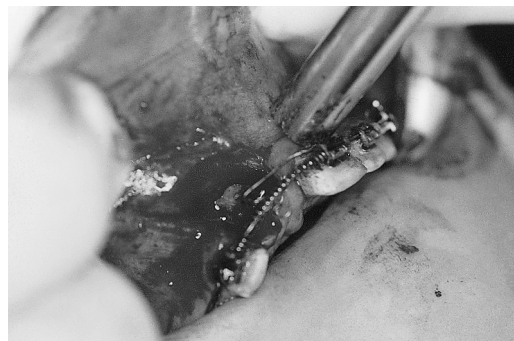


Figure 7. Re-exposure of the UR1, and tough entwining fibrous tissue removed (24.3.99).



Figure 8. The UR1 moving into the occlusion via bilateral whips (6.5.99).



Figure 9. The UR1 appears through the gingival tissues (27.5.99).



Figure 10. The UR1 crown moving occlusally (1.6.99).



Figure 11. Bracket attached to the UR1, and final occlusal movement started (2.9.99).



Figure 12. The UR1 in the occlusion and undergoing root torque (13.1.00).