Endodontic microsurgery and prosthodontic treatment of a permanent anterior concrescence: a case report

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Abstract

Concrescence is a rare dental anomaly in which two adjacent teeth are united only by their cementum. Concrescence most frequently occurs in molars, especially a third mandibular molar and a supernumerary tooth. It is rarely seen in the maxillary anterior teeth. This case report is the first in the literature which details the successful treatment of a concrescence between the maxillary central incisor and a supernumerary tooth through multidisciplinary therapy. The treatment plan included root canal treatment, endodontic microsurgery, and prosthodontic treatment.

Keywords: Concrescence, Endodontic microsurgery, Multidisciplinary therapy, Odontogenic keratocyst

Introduction

Concrescence is a rare dental anomaly that occurs when two adjacent teeth are
connected only by their cementum. The prevalence of concrescence has been observed to be between 0.09% and 0.36% in studies conducted around the world, with the lowest prevalence reported in India and the highest in France.\textsuperscript{1-3} Concrescence can be classified into two types, resulting from either root formation (developmental concrescence) or chronic inflammation (inflammatory concrescence). The presence of subgingival union makes the diagnosis and treatment of concrescence challenging. If left untreated, it could lead to chronic apical periodontitis, destruction of periodontal tissue, and create complications for orthodontic and prosthodontic treatments.

This case report details the successful treatment of a concrescence between the maxillary central incisor and a supernumerary tooth through the use of multidisciplinary therapy. The treatment plan included root canal treatment, endodontic microsurgery, and prosthodontic treatment.

**Case Report**

A 32-year-old male was referred to Hefei Stomatological Hospital, Anhui Medical University, China, for endodontic and prosthodontic treatment of the maxillary central incisor in November 2022. Upon intra-oral examination, an anomalous morphology of the right maxillary central incisor accompanied by discolouration and buccal tilt was observed (Figure 1a). Additionally, there was periodontal swelling and discharge in the same region; a depth of 9mm buccal periodontal pocket was also discovered (Figure 1b). Cone-beam computed tomography (CBCT) showed the presence of concrescence between the right maxillary central incisor and a supernumerary tooth, which exhibited only cemental union. CBCT revealed a pathology in the middle of the root for tooth #11. For the supernumerary tooth, obvious pulp calcification was observed, and the root canal was not visible (Figure 1c).

The patient was diagnosed with tooth concrescence, chronic apical periodontitis, and periodontal disease. Conventional root canal treatment and endodontic microsurgery were chosen. The patient signed a written informed consent for surgery and publication of the case report.
Due to pulp calcification, the root canal of the supernumerary tooth could not be seen under the microscope. After obturation, a postoperative photograph was taken (Figure 2a). During endodontic microsurgery, the granulation tissue near the middle of the main root was scraped off. Retrograde preparation extended 3mm along the supernumerary root canal and lateral root canal orifice of the principal root. Mineral trioxide aggregate (MTA) was used for retrograde filling (Figure 2b). After two weeks, the cast metal post and ceramic crown had corrected the lip deformity (Figure 2c). The granulation tissue was preserved and stained for histopathological analysis. The fibrous capsule was lined with multilayered squamous epithelium, confirming that it was an odontogenic keratoceyst (Figure 2d).

At the six-month review, restoration was still in good shape and function. For tooth #11, the radiolucent area in the middle of the root was absent (Figure 2e & 2f).

Discussion

This case report presents a successful multidisciplinary therapy for the concrescence between the permanent maxillary central incisor and a supernumerary tooth, which is a rare occurrence worldwide. This case involved periodontal destruction and odontogenic keratoceyst. The outcome of the therapy was positive.

There are two types of concrescence: developmental concrescence and inflammatory concrescence. Developmental concrescence is caused by lack of space during root formation, while inflammatory concrescence can result from various factors such as trauma, carious lesions, and orthodontic treatment during radicular development. In this case, chronic apical periodontitis and periodontal disease could persist for a long time, leading to interdental bone resorption and cemental union after root formation. The use of CBCT imaging allowed for the identification of two distinct root canal systems with normal orifices in the concrescence, leading to its classification as an inflammatory concrescence. This proved to be invaluable in devising a feasible treatment plan and minimising potential complications.4

The prevalence of odontogenic keratoceysts was noted to be approximately 11% among
oral developmental cysts. In this case, CBCT demonstrated a radiolucent area around the mid-root region on the buccal aspect of tooth #11. The cyst was easily removed from the root and adjacent bone tissue during endodontic surgery. A definitive microscopic diagnosis of odontogenic keratocyst was established. Odontogenic keratocyst was reclassified as a tumour instead of a cyst by WHO in 2005. Although odontogenic keratocysts have the potential for aggressive growth and destructive behaviour, they can be effectively managed with simple surgical enucleation.

The treatment of concrescence teeth should be personalized or multidisciplinary, including extraction, root canal therapy, division, and orthodontic intervention. In this case, concrescence had resulted in periodontal destruction, aesthetic issues, and chronic apical periodontitis. Due to the high degree of root combination, surgical division of the concrescence would have posed a significant challenge. The patient refused orthodontic traction for aesthetics because of lack of time. Accordingly, the patient received appropriate and cost-effective therapy with endodontic surgery and ceramic crown restoration. The curvature of the dental arch was reduced, resulting in a narrower crown width for concrescence. It is imperative that the patients are informed about this aspect.

Conclusion

The accurate diagnosis and conservative treatment contribute to the preservation of concrescence. This case report describes a rare concrescence of a maxillary central incisor and a supernumerary tooth, which was treated with multidisciplinary therapy. A multidisciplinary approach involving practitioners from different departments enhanced the efficacy of the therapy plan.

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Conflict of Interest: None to declare.

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References


Figure 1. 1a: pre-operative photograph; 1b: depth of 9mm buccal periodontal pocket; 1c: pulp calcification was noted for supernumerary tooth.

Figure 2. 2a: obturation; 2b: retrograde with MTA; 2c: prosthodontic treatment for concrescence; 2d: histopathological examination; 2e & 2f: at six-month review