

Microsurgical endodontic treatment of the first lower molar – surgical removal of the cyst, apical resection, retrograde root canal preparation and filling: A Case Report

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Abstract

Endodontic microsurgery is a predictable alternative to nonsurgical treatment of persistent and recurrent apical periodontitis. It is commonly performed to remove a portion of the root with undebrided canal space and to seal the canal apically when a complete seal cannot be accomplished with nonsurgical root canal treatment through an orthograde approach. In this case report successful apical resection of the the first lower molar with a cystectomy procedure is presented along with a brief review of apical resection as a treatment modality. The patient refused to remove the 35-37 dental bridge, so conservative root canal treatment was impossible. MTA was selected for retrograde filling due to its good biocompatibility, ease of manipulation and good setting in humid environment.

Keywords: Microsurgery, apical periodontitis, cystectomy, apical resection.

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1. Introduction

Apical resection is a process when apex of the root is removed while leaving the crown and remaining roots in function. Apical resection has been performed in dentistry since the late 1800s. With proper long-term monitoring and maintenance, apical resection is accepted as a valid treatment with reasonable long-term effectiveness. Microsurgical approach is a treatment option for molars with periodontal, endodontic, restorative or prosthetic problems.

2. Case report

2.1 Anamnesis. 46-year-old patient was referred to Lithuanian University of Health Sciences Department of Dental and Oral Pathology for 36 tooth root canal treatment. The patient has been complaining periodically of severe pain in the 36 tooth every couple of months, tenderness while biting, touching with tongue. The pain disappeared when antibiotic treatment was started. The complaints lasted for years. He refused to remove the permanent crowns.

2.2 Examination. Face within the limits of physiological symmetry. Prosthetic dental crowns from 36 to 37 teeth with cantilever to 35 tooth are observed. Dental bridge is good quality with no inadequate edges. 36 tooth was tender to vertical percussion and palpation.

2.3 X-ray evaluation. 36 tooth – oval-shaped bone destruction observed in projection of root apex (Fig. 1). Poor quality endodontic treatment – canal filling inhomogenous, does not reach apices, apical resorptions are seen. The fragment of the detached instrument is suspected in the apical third of medial root. Metal post 2/3 of the root length contrasts in the canal of the distal root (Fig. 2).



Fig. 1. Orthopantomogram before treatment



Fig.2. Dental x-ray before treatment.

2.4 Preliminary diagnosis. *Chronic apical periodontitis* (histological examination is required to clarify the diagnosis).

2.5 Treatment plan:

1. Surgical removal of the cyst
2. Resection of 36 tooth root apices with retrograde filling

2.6 Treatment. During the first visit, local anesthesia was administered. The mucous membrane flap was opened, bone defect localized, capsular tissue was found and removed, granulation tissues were scraped off, 36 tooth apices resected 3 mm. Ultrasonic tips were used to prepare the canals and retrograde filled with MTA (MTA Angelus) about 4 mm and stitched with Vicryl 5.0 thread. Dental x-ray was performed after the procedure (Fig. 3). The capsular tissue was sent for biopsy. After 10 days the sutures were removed and the wound was healed.



Fig.3. X-ray after treatment

2.7 Result of treatment. A biopsy confirmed the diagnosis of a radicular cyst. The patient did not appear for X-ray control after 3 months. Complaints and pain was gone, so he refused to come for follow up. He arrived to follow up 6 months after the surgery (Fig. 4). He had no complaints. The radiograph shows recovering destruction of the alveolar bone. Further tooth follow up is required until completely healed.



Fig. 4. X-ray after 6 months

3. Discussion

Radicular cysts are the most common odontogenic cysts of infectious origin that are commonly found at the root of the causal tooth. Root resection is usually indicated when the periodontal destruction does not heal after conservative approach, when conservative treatment is impractical or favourable outcome is unlikely. Endodontic microsurgery removes cysts with the capsule, necrotic and granulating tissue. The results of a meta-analysis conducted in 2015 state that the overall success rate of endodontic microsurgery is 92% and the microscope used in the procedure statistically significantly increases the likelihood of success.

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