

Autogenous Chin Graft in Treatment of a Periapical Lesion: A Case Report

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Abstract: Periapical endodontic surgery is a safe and adequate alternative when teeth are not responding to conventional treatment and endodontic re-treatment. It is a treatment of choice in endodontic failure cases where retreatment has also failed. Endodontic treatment failures can be related to: extraradicular infections such as periapical actinomycosis; to foreign body reactions that can be caused by endodontic material extrusion; to endogenous cholesterol crystal accumulation in apical tissues; and unresolved cystic lesion. Paraendodontic surgery comprehends a set of procedures recommended in periapical diseases treatment, when traditional endodontic therapy does not obtain favorable outcomes. The objective of the study was to report a clinical case where an apicoectomy was indicated due to failure in conventional endodontic treatment. The following case report presents a case of a tooth with unsatisfying conventional endodontic treatment wrt 31, due to over obturation of the root canal with a persistent periapical lesion. The chosen treatment plan was to perform apicoectomy and placement of an autogenous chin graft. The treatment was successful due to absence of fistula and painful symptoms and due to periapical bone repair.

Keywords: Periapical surgery, Autogenous bone graft, Apicoectomy, Over obturation.

INTRODUCTION

The aim of endodontic therapy is to eliminate bacteria from the root canals and to establish an effective hermetic seal. Cleaning, shaping and filling of the entire root canal system are mandatory steps to ensure successful endodontic therapy.

Failure factors in root canal conventional treatment are frequently related to 'Presence of residual bacteria (persistent infection) or reinfection in a previously disinfected canal (secondary infection) [1]. These factors, could be related to: extraradicular infections such as periapical actinomycosis [2]; to foreign body reactions that can be caused by endodontic material extrusion [3]; and unresolved cystic lesion [4] to endogenous cholesterol crystal accumulation in apical tissues [5]; Thus, different factors determine the rate of success which can be verified through clinical and radiographic.

Persistent periapical lesions require surgical intervention; although retreatment is the first therapeutic alternative. The first option would be Calcium hydroxide dressing. Moreover, mishaps during conventional treatment may have negative effect over success, contributing to infection establishment in inaccessible apical areas [6, 7].

When traditional endodontic therapy does not obtain favourable outcomes, then Paraendodontic surgery/ Periradicular surgery is recommended in periapical disease therapy. The aim is periapical lesion removal and apical third sealing, allowing soft and hard tissue regeneration [8, 9].

According to the European Society of Endodontology 1994, the indications for periradicular are; obstructed canal with radiologic findings and/or clinical symptoms, extruded material with radiologic findings and/or clinical symptoms, failed root canal treatment when retreatment is inappropriate (isthmus tissue, persistent acute symptoms or flare-ups, risk of root fracture), perforations with radiologic findings and/or clinical symptoms, and where it is impossible to treat from within the pulp cavity [21].

The main objective of periapical surgery is to obtain tissue regeneration. This is achieved by the removal of periapical pathologic tissue and by exclusion of any irritants within the affected root [10]. Thus, this study aims to report a clinical case of apicoectomy indicated due to conventional endodontic treatment failure.

CASE REPORT

A 42 year-old female patient reported to the Dental College complaining about pain in tooth # 31, 41. After clinical and radiographic examination, unsatisfying endodontic treatment was confirmed in the referred teeth (Fig. 1).



Fig. 1: Over obturation wrt 31. Periapical lesion wrt 31 and 41

Radiographic image suggested a persistent injury in the periapical region of the due to over obturation wrt #31. A 2x2x2 mm diameter radiolucency was observed wrt the mandibular anteriors (31,32, 41 and 42). Based on the clinical and radiographic findings, periapical surgery was planned. The treatment plan was explained to the patient and informed consent was obtained. Supraperiosteal and subperiosteal anesthetic techniques were adopted. The topical anesthetic used was Lidocaine and the local anesthetic was 2% Lidocaine with epinephrine 1:80,000. Neumann's incision was chosen, starting from the mesial surface of tooth #34 to the mesial surface of tooth #44 (Fig. 2).



Fig. 2: Clinical examination

With the aid of a scalpel blade size #15 the periapical exposure was satisfactory, to make the injury visible (Fig. 3).



Fig. 3: Defect after raising the flap

The area was exposed further using round carbide bur sized #4 and #6. Apical curettage was performed using lucas curette size #85 and #86.

Then, 3 mm was cut from root apical area; with the aid of size #702 bur. Surgical site irrigation was executed with water for injection. An irregularly shaped healthy bone was taken from the symphysis region distal to the defect and placed as a graft in the curetted area (Fig. 4). The healthy bone was first stamped using a sharp straight probe and then removed using the round carbide burs.



Fig. 4: Stamping of the bone in the symphysis region

The autogenous chin graft filled the defect in the cortical bone (Fig. 5).



Fig. 5: Grafting of the cortical bone with the autogenous chin graft

The flap was approximated and interrupted silk sutures were placed (Fig. 6).



Fig. 6: Interrupted sutures placed

Post surgery radiograph was taken (Fig. 7).



Fig. 7: Post operative radiograph

Another radiograph was taken after 3 months of follow-up (Fig. 8). Satisfactory healing was seen. The autogenous chin graft filled the defect in the periapical region. Satisfactory bone healing was also seen in the t in the symphysis region (Fig. 8).



Fig. 8: Radiograph after 3 months

DISCUSSION

Excision of periapical tissue from root surface (including apical accessory canals), and sealing the canal or canals against pathologic agents, enables the clinician to reach the goal of creating the best conditions to the tissue health, regeneration and creation of new tooth structural support. (11)

Curettage with apical planing, apicoectomy with retrofilling, apicoectomy with retroinstrumentation and canal retrofilling are some of the most adopted surgical methods to solve difficulties, accidents and complications of conventional endodontic treatment, and filling simultaneous to surgery [12].

Apicoectomy involves the surgical management of a tooth with a periapical lesion which cannot be resolved by conventional endodontic treatment. Since the term “apicoectomy” consists of only one aspect (removal of root apex) of a complex series of surgical procedures, the terms “periapical surgery” or “periradicular surgery” are more appropriate. (10).

This particular surgical intervention can be indicated in several clinical situations: periapical lesions persistent to conventional treatment, perforations, fractured instruments, apical delta removal and external absorption presence [13, 14, 15]. In this clinical case, the chosen treatment was apicoectomy with curettage and planning, because the patient was willing for the planned treatment.

Inconsistent success rates were reported for periradicular surgery varying between 44% and 90%.[10] Based on a various reviewed studies, a success rate of 81% was found for periradicular surgery with simultaneous orthograde treatment compared with only 59% for periradicular surgery without simultaneous orthograde treatment.[10]

Although some authors [16] advocate that the larger the cut angle, larger will be the exposure of dentinal tubules, the apical portion was cut in 45° related to tooth long axis [17].This inclination degree was required to allow total root surface exposure, aiming to facilitate the operative procedures.

Size #702 tapered bur was chosen as the drill as it made cutting easier through all root extension. Reduction of the lateral canal in 93%, was seen when the apical cut was performed at 3 mm without the need of largest resections [11]. In this case as well, 3 mm of apical reduction was done. Leonardi *et al.* [18] stated that several factors can influence apicoectomy success, such as: the root region where the apicoectomy is done; the drill type employed or laser execution, as well as the

cut angle. The apical cut should be regular and must involve anatomical variations such as isthmuses and accessory canals, as they act as a reservoir for necrotic pulp tissue and bacteria. This could lead to failure of the treatment modality.

Curettage at the periapical region ensures removal of the pathological in this case curettes # were used. Apical planning must be followed after this step as it is necessary, because the cement covering the root apical portion gets reabsorbed due to periapical lesion [19].

Apical cut surface finishing must be performed later; to promote new-formed cement deposition over the sectioned apical dentine [20]. This can be done using manual or mechanical instruments, such as steel files and drills. In this clinical case, a zero degree bevel was given. This step ensures planing and sealing of dentinal tubules that were exposed to promote repair.

CONCLUSION

The surgical technique applied in this case, apicoectomy, was appropriate. This was proven by both clinical results as well as follow-up radiographs. The autogenous chin graft filled the defect in the periapical region. Satisfactory healing was seen radiographically after 3 month of follow-up.

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