

Case Report

Truss access new conservative approach on access opening of a lower molar: A case report

M. Karthick Auswin, Sindhu Ramesh

Department of Conservative Dentistry and Endodontics, Saveetha Dental College, Saveetha University, Chennai, Tamil Nadu, India

Correspondence: Sindhu Ramesh, Department of Conservative Dentistry and Endodontics, Saveetha Dental College, Saveetha University, 162, Poonamallee High Road, Chennai – 600 077, Tamil Nadu, India. Phone: +91-9840136543. E-mail: drsinramesh@gmail.com

ABSTRACT

This case report describes a clinical case of lower molar submitted to root canal treatment with emphasis on a new conservative approach employed in access opening. A 32-year-old female patient suffered severe sensitivity of the right lower first molar with severe attrition involving enamel and dentin as well as pulp exposition. The woman was given root canal treatment with a new conservative approach on access opening of lower molar in single visit and high strength direct composite restoration done. This technique mainly implies on the preservation of the remaining tooth apart from providing adequate disinfection, preparation, and filling of the root canal.

Keywords: Conservative approach, access opening, minimal invasive dentistry, preservation of tooth structure

Introduction

Minimal invasive dentistry is of great biological value than the artificial prosthesis. For the past few decades, the need for the conservation of tooth structure has been increasing in dentistry, especially in the preventive and restorative part of dental treatment. Carious lesions and dental fractures are usually associated with endodontic pathologies. The field of endodontics started focusing on new conservative approaches on access opening of root canal treatment. This technique mainly implies on the conservation of remaining tooth structure.

Case Report

A 27-year-old female patient was referred to a dental clinic with severe sensitivity in the right lower back tooth region. Intraoral examination revealed severe attrition of the right lower first molar [Figure 1]. Radiographic examination showed radiolucency involving enamel, dentin, and pulp [Figure 2].

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Coronal access

Following the delivery of local anesthesia and isolation with rubber dam, coronal access was made out just exactly above the mesial pulpal horn [Figure 3]. The access to pulp chamber was gained from occlusal surface to roof of the pulp chamber by orienting the bur parallel to the long axis of the tooth in oval shape buccolingually with an Endo access bur (Dentsply/Maillefer bur size no #2). Then, the bur was placed over the distal pulpal horn and the access to the pulp chamber is gained [Figure 4]. An Endo Z bur was used inside the pulp chamber at high-speed rotation creating a divergent walls in the access cavity.



Figure 1: Pre-operative clinical photograph

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Exploration

The root canal was explored using 5.25% sodium hypochlorite solution with a 21-mm long, precurved, K-file size #10 (Dentsply/Maillefer). Initial insertion was carried out with watch-winding motion until it reaches the root apex.



Figure 2: Pre-operative radiograph



Figure 3: Access initiated above mesial pulpal horn



Figure 4: Occlusal view of access cavity

Root canal preparation

Root canal preparation was carried out under irrigation with 5.25% sodium hypochlorite. Cervical preflare of the canal orifice was carried out with Gates-Glidden bur sizes #2 and #3 [Figure 5]. The working length was measured using Propex mini apex locator (Dentsply/Maillefer). The four canals are mesiobuccal, mesiolingual, distobuccal, and distolingual had a working length of 18 mm from the coronal reference point [Figure 6].

The cleaning and shaping of the root canals were done with ProTaper Universal Rotary Files (Dentsply/Maillefer). The shaping of the coronal $2/3^{rd}$ of the root canal is done with SX-S2 and finishing was done with F1-F2 in brushing motion. Irrigation was performed with alternating 5.25% sodium hypochlorite and Endo prep RC (15% EDTA and 10% carbamide peroxide) followed by saline irrigation. Hand, as well as ultrasonic agitation, was done with 5.25% sodium hypochlorite to remove the pulpal tissue so as to have a proper disinfection of the root canals.

Root canal filling

The canal was dried with absorbent paper points (DiaDent). A master gutta-percha point of F2 0.6 taper of length 18 mm was



Figure 5: Microscopic view



Figure 6: Working length determination



Figure 7: Master cone radiograph



Figure 8: Obturation done

placed and master cone radiograph was taken [Figure 7]. Then, the AH plus cement (Dentsply/Maillefer) was prepared according to the manufacturer's instruction and inserted into the root canal together with the gutta-percha point to the working length.

The gutta-percha is then sheared off at the canal orifice and the high strength composite restoration is given and radiograph was taken to visualize adequate packing of the restorative material [Figure 8].

Discussion

Proper diagnosis and removal of the etiopathological elements are the key for successful endodontic treatment. Proper illumination and magnification help in identification and removal of caries which helps to preserve a lot of healthy dental tissue in endodontic treatment. Root canal treatment is the most effective treatment protocol for pulpal and periapical pathology. Root canal treatment mainly relies on complete cleaning and disinfection of root canals and filling it biologically compatible materials.^[1] Conventional root canal preparation gains a straight line access to the root canals which ultimately results in excessive loss of tooth structure which may affect the rigidity of the tooth.^[2] As a result of this, the fracture resistance of the tooth decreases.^[3] With the introduction of microscopes, newer root canal instruments the preparation of the conservative access opening had gone to a newer level. Conservation of the cervical dentin is the most important aspect for maintaining the normal function and longevity of the restored tooth.^[4,5]

It is essential to know the anatomical structures and variations so that the sound tooth structure from caries removal to root canal enlargement can be preserved. It is important not to gouge cervically, laterally, and into the floor while preparing the access. The judicious orifice location and careful canal penetration are essential during access opening. Care must be taken when using the concepts of minimal invasive dentistry which relies on preserving tooth structure.^[6-8] The main cause of failure of root-filled teeth is a loss of tooth structure. Traditional access cavity preparation is found to be the second largest cause of failure of root canal treatment.^[9] Thus, a reduced endodontic access design would reduce the failure of root canal treatment.^[10] Improved prognosis of root canal treated teeth is seen in conservative endodontic cavity, or ultraconservative "endodontic cavity."[11,12] Although contracted endodontic cavities (CEC) improved fracture strength more than traditional endodontic cavities, it could increase the risks of inefficient canal instrumentation and the occurrence of procedural errors as previously reported.^[12] However, a recent study showed that CECs in maxillary molars did not appear to impact instrumentation efficacy.^[13]

Conclusion

Minimally invasive endodontics has challenged the conventional approach in the recent years.^[14] This truss access approach mainly emphasizes on the preservation of the healthy tooth structure with the minimally invasive approach. The type of restoration chosen for a root filled tooth depends on the amount of remaining hard tissue structure available after root canal therapy, which influences long-term survival. This minimal invasive approach in access opening avoids the need for conventionally placed crowns.

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