

Diagnosis and Management of Cracked Mandibular Molar Tooth: A Case Report

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ABSTRACT

A cracked tooth is a thin surface disruption of enamel and dentin, and possibly cementum, of unknown depth or extension. Depending on crack extent and crack location, treatment for cracked teeth can range from composite resin restorations or crowns to root canal treatment followed by cuspal coverage or sometimes extraction. This case report presents diagnosis and management of a cracked mandibular molar tooth with root canal treatment.

INTRODUCTION

A cracked tooth is defined as a tooth with 1 or more incomplete, longitudinal fractures originating in the coronal tooth structure and extending apically; the crack typically orients mesiodistally, involves the marginal ridges, and includes the proximal surfaces of the tooth (1). Methods commonly used to identify cracked tooth are visualisation of the crack through magnification using loupes or dental operating microscopes and bite test. Cracks block the transmission of light and transillumination has been reported to be an effective tool in crack detection (2,3,4). The incidence of cracks has been reported to be higher in lower second molars and intact teeth. Root canal treatment (RCT) is a reliable treatment for cracked tooth with a pulpal diagnosis of irreversible pulpitis or plural necrosis, with a 2 year survival rate of 90.0% (5).

BRIEF NOTE ON INDIAN TRADITION, FOOD AND HEALTH

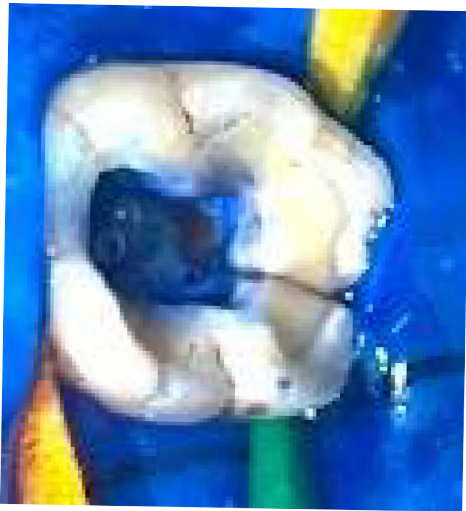
A 52-year-old male patient reported to the department of Conservative dentistry and Endodontics, Thai Moogambigai Dental College and hospitals with a complain of pain on chewing in the lower left back tooth region. On intraoral examination, a crack line was visible in 47 on the distal marginal ridge. Patient had pain on cold test lingering for more than 15 seconds suggestive of symptomatic irreversible

pulpitis. There was no tenderness on percussion / periapical palpation and periodontal probing depth was below 5mm on all the areas around the teeth. Hence a diagnosis of symptomatic irreversible pulpitis in 47 was made.



Local anaesthesia was administered and the tooth was isolated with rubber dam. A traditional access cavity was prepared with an Endo Access Bur #2 (Dentsply International, Tulsa, OK). The root canals were located using a DG 16 probe (Dentsply Maillefer, Ballaigues, Switzerland). The coronal two thirds of the canal was scouted with a #10 K-file (Mani Inc, Utsunomiya, Japan) to verify a smooth glide path. The working length was established using a size 10 K-file (Mani Inc) and an electronic apex locator (Root ZX mini; J Morita, Tokyo, Japan) and verified with a periapical radiograph. A mechanical glide path till the working length was created with a #15 K-file

(Mani Inc, Utsunomiya, Japan). Subsequently, the scouted canal space was instrumented by S1 and S2 files (ProTaper Gold, Dentsply Maillefer), which aided in achieving a straight-line access to the apical third of the canal. A total of 10 mL 5.25% sodium hypochlorite (NaOCl) was used to irrigate each root canal in this phase. The cavity is then stained with methylene blue dye to check for the extension of crack.



DISCUSSION

The diagnosis of a cracked tooth is challenging because the symptoms are variable, crack lines may not be visible and there is no precise way to prognosticate a cracked tooth (7). The prognostic factors affecting the outcome of cracked tooth reported are probing depth more than 5mm, cracks involving the distal marginal ridge and crack extending to the orifice of the root canal (5). Hence, practitioners are often unclear if the cracked tooth should be restored and retained or extracted and replaced (8). The etiology of cracks has been related to several factors including excessive parafunctional forces or occlusal interferences, trauma and also restorative materials with significant thermal expansion and contraction coefficients (9-12). Increased masticatory forces that results from nonfunctional jaw movements related to bruxism and clenching tend to separate the cusps of posterior tooth which may increase the risk of tooth fracture (13). Root canal treatment is a reliable treatment for cracked tooth, with a 2 year survival rate of 90.0%. Deep probing depths of more than 6 mm were significantly associated with reduced survival of cracked teeth after root canal treatment

(8). Endodontically treated cracked tooth showed an overall survival rate of 84.1% at 5 year (14). Tooth with a radicular extension of crack has been treated with intracanal bonded restoration (obturation material was removed 2-3 mm apical to the deepest part of the radicular crack and after conditioning and bonding agent application, Giomer was placed as an extended orifice barrier) followed by full coverage crowns. This treatment modality showed 96.6% survival rate after 4 years (15). Bonding of composite restoration in tooth with cracks extending to middle and apical thirds of the root has been reported to be successful in more than 50% of the teeth after 5 years and prevent alveolar bone loss due to the crack (16).

CONCLUSION

Cracked tooth can be restored with root canal treatment followed by composite core build up and cuspal coverage, however the tooth has to be followed up to check for any symptoms and pocket formation which can lead to poor prognosis of the tooth.

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