



## MANAGEMENT OF CRACK TOOTH SYNDROME- CASE REPORT

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### ARTICLE INFO

#### Article History:

Received 8<sup>th</sup> June, 2016  
Received in revised form 11<sup>th</sup>  
July, 2016 Accepted 6<sup>th</sup>  
August, 2016 Published online 28<sup>th</sup>  
September, 2016

#### Key words:

Crack Tooth Syndrome, Diagnosis,  
Reattachment, Healing

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### ABSTRACT

The term cracked tooth syndrome (CTS) means an incomplete fracture of a vital posterior tooth involving the dentine and occasionally extending in the pulp. Cracks in teeth can be found in symptomatic and asymptomatic teeth, and are an etiological factor in pulpal disease, as the cracks in the teeth are found to have bacteria present them or the bacterial toxins. This case report is presenting case with crack tooth syndrome having varied location and depth of the crack and the treatment and follow up.

### INTRODUCTION

Teeth having cracks and fractures have become a common diagnosis in recent dental practices. The term cracked tooth syndrome (CTS) means an incomplete fracture of a vital posterior tooth involving the dentine and occasionally extending in the pulp.<sup>[1-3]</sup> The term was first coined by Cameron in 1964<sup>[1]</sup>. Since 1954, this condition has been continuously re-defined. However, there is no common and constant definition due to which it has left the clinicians in confusion. Recently the term is crack tooth syndrome is redefined as "a fracture line of unknown direction, depth and origin passing through tooth structure which may or may not progress to communicate with the pulp and/or periodontal ligament."<sup>[4]</sup>

Patients often approach the dentist with a history of severe pain which is difficult to locate. The pain is sharp and intermittent, although such cracks results in a wide range of symptoms from occasional pain on biting to severe and prolonged pain. Symptoms are mostly dependent on the depth and direction of the crack and the structures involved<sup>[5]</sup>. Crown and crown-root fractures are usually incomplete fractures originating in the crown of posterior teeth from an internal line angle at the floor of a restoration, and usually involve a marginal ridge with in a mesiodistal direction. The fracture line starts in the crown and may end in the close to that of the cemento-enamel junction or extend apically into the root<sup>[6-9]</sup>. Cracks in teeth can be found in symptomatic and asymptomatic teeth, and are an etiological factor in pulpal disease, as the cracks in the teeth are found to have bacteria

present them<sup>[10]</sup> or the bacterial toxins<sup>[11]</sup>. This case report is presenting case with crack tooth syndrome having varied location and depth of the crack and the treatment and follow up.

#### Case Report

A male patient, 55 years old reported to the Department of Conservative Dentistry and Endodontics with chief complaint of pain in upper left back region, for the past 4 days. The pain was sharp and intermittent in nature which aggravated on biting. Patient mentioned history of incomplete root canal treatment of the tooth in upper back region at a private dentist and medical history was non contributory. Social and family history of the patient was not relevant.

Clinical examination revealed complete fracture involving the occlusal surface of the tooth extending from mesial to distal marginal ridge. The tooth had grade-1 mobility. Radiographic examination revealed bone loss distally.

#### Investigations

Intraoral periapical radiographs

#### Differential diagnosis

Vertical crown root fracture

#### Treatment

The treatment began with a posterior superior alveolar nerve block using 1:200000 lignocaine hydrochloride. Followed by approximation & immobilization of the tooth with orthodontic steel band in order to ensure safety. Access opening was

modified to obtain a straight line access to all the canal apices (Figure A). The vital pulp was removed with the help of barbed broaches. The incomplete fracture line was evident on the walls of access cavity.

The tooth was irrigated using normal saline and 2% hydrogen peroxide simultaneously after each file to ensure thorough cleaning and shaping of the canals and intermittent use of 17% EDTA was also done. (Figure B). ProTaper with a 6% taper was used for the biomechanical preparation till F1. Intracanal dressing using Calcuim hydroxide was given for a duration of 15 days and the patient was prescribed analgesic and antibiotics for three days. The patient was recalled after 15 days and the patency and the dryness of the canals were confirmed after which the tooth was obturated with gutta-percha using AH plus resin based sealer (Figure C), followed by saucerization using a small round bur along the fracture line (Figure E). The fracture line was then sealed using glass ionomer cement followed by temporization with zinc oxide eugenol cement (figure F). After a week of being asymptomatic the tooth was restored using resin composite (Figure G). After four weeks of an observational period, the tooth was prepared, and porcelain fused with metal full crown was given (Figure I).



A: Preoperative photograph; B: Preoperative radiograph; C: working length; D: Master cone; E: Saucerization; F: sealing of the crack; G: Post obturation restoration; H: Temporary crown; I: Permanent crown



J: one year follow up

### Follow-up

In follow-up visits the clinical examination revealed normal healing no pain and the mobility had reduced. One year follow up revealed healing of the periapical radiolucency and healthy bone formation (figure j)

### DISCUSSION

Cracks are considered as a potential pathway of entry for bacteria into the tooth<sup>[12]</sup>. If sufficient number of bacteria is

present in the crack and if the particular bacteria are virulent enough they may cause pulp and periradicular diseases<sup>[13]</sup>. Early diagnosis of the condition can prevent further progression of the crack and the bacteria avoiding complications. Splinting the tooth should be the first step toward treating such cases which will ensure stability and safety of the tooth. Deoccluding the involved tooth can also prevent further propagation of the crack<sup>[14]</sup>. In 20% of cases root canal therapy may be required due to irreversible pulpitis<sup>[15]</sup>. However; in these cases, the crack was extending to the pulp chamber and the symptoms were suggestive of irreversible pulpitis requiring an endodontic treatment. Single sitting endodontic treatment was carried out. In the first case report calcium hydroxide dressing was given to disinfect the canal and initiate healing. The access preparation was then restored with a resin composite restorative material. Composite resin has an advantage of holding the fractured tooth segments together; as it is an adhesive material. When full-coverage crowns were used to stabilize the compromised tooth, high success rate was reported according to the studies<sup>[16]</sup>. Thus, the teeth were restored with porcelain fused with metal crowns. The radio opacity of total healing could be noticeable radiographically after a period of nine months to one year which is appreciable in the first case after one year follow up<sup>[17, 18]</sup>.

### CONCLUSION

A good history taking will provide perfect assistance for diagnosis. Clinical examination and inspection in addition to specialized tests will be conclusive. Armed with the necessary awareness and awareness, the dental practitioner should have no difficulty in diagnosing and managing the crack tooth syndrome.

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