CASE REPORT

MANAGEMENT OF HORIZONTAL FRACTURE

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ABSTRACT : Management of horizontal root fracture presents a formidable challenge for clinicians because of the difficulty of achieving a stable reunion of fractured fragments. This article presents endodontic management of horizontal root fracture using a fibre post. A 30 year old male patient presented with a horizontal fracture of maxillary right central incisor. Root canal treatment followed by internal splinting using a fibre post gave satisfactory results.
KEYWORDS : Horizontal Fracture; Central Incisor; Splint; Fibre post

INTRODUCTION:

Horizontal fractures occur most frequently in the upper anterior teeth due to their position in the arch. These fractures are generally transverse to oblique and may be single or multiple, complete or incomplete. The initial treatment consists of the repositioning of displaced coronal segments, followed by the stabilizing of the tooth to allow healing of the periodontal ligament supporting the coronal segment to occur.[1] The amount of dislocation and the degree of mobility of the coronal segment affect the prognosis.[2] Achieving stable fracture reduction is inversely proportional to the severity of dislocation, mobility, and pulpal injury.

Endodontic intervention is required for non- healing fractures. The following are the treatment options carried out with varied levels of success:

- Root canal therapy of both segments.[3] This may be indicated in fracture cases when the segments are not separated, but leakage from the fracture line can lead to failure;
- Root canal treatment of the coronal segment only, if this segment shows no mobility.[4]
- The use of an intra-radicular splint has been recommended by Weine et al. [5]
- Root extrusion is a solution for teeth with root fractures at or near the alveolar crest.[6]
- Placement of endodontic implant with or without periapical surgery. [7]
- Extraction and subsequent replacement with prosthesis.[3]

No treatment guidelines are available for a tooth showing increased mobility, other than extraction and subsequent replacement with prosthesis. The aim of this article is to report successful management of a horizontal root fracture using a fibre post.

CASE REPORT

!A 35 yr old male patient reported to the Department of Conservative Dentistry & Endodontics, with chief complaint of pain & tenderness associated with mild bleeding from his upper front tooth region since last 3 days. The pain was severe in nature, localized, aggravated on pressure from mastication/ occlusion and relieved on taking medication. History of present illness revealed traumatic injury to the patient 5 days back.

Clinical examination revealed: (FIG 1)

- Slight inflammation of the adjacent soft tissues.
- Ellis class III fracture irt 21
- Ellis class II fracture irt 22

Radiographic examination revealed: (FIG 2)

- Horizontal root fracture (Ellis class VI) irt 11
- Ellis class III irt 21
- Ellis class II irt 22

Tactile examination revealed mobility irt 11. 11, 21 were tender on percussion. All involved teeth were non vital on vitality tests.

Treatment modality consisted of:

- Repositioning of the fractured segment of 11 (FIG 3)
- Root canal therapy of irt 11, 21 , 22 (FIG 4,5,6)
- Internal stabilization of tooth 11 using glass fibre post (FIG 7,8)
- Esthetic management of coronal structures (FIG 9)

First step of treatment entailed stabilization of the fractured segment irt 11. This was done using fiber reinforced composite splint. Under proper medication coverage root canal therapy of 11,21,22 was initiated. Single sitting root canal therapy was done in 11. In the subsequent appointment patient was asymptomatic, post space was prepared irt 11 using peeso reamers. Glass fibre post was luted irt 11 to achieve stability of fractured segment. Esthetic management of coronal structures irt 11, 21, 22 was done using composite resin. A 6 month follow up elicited a good response. Patient was asymptomatic and radiographically healing was observed. (FIG 10).

DISCUSSION

Preservation of the natural dentition and restoration of the oral cavity to a normal functional state is a primary goal in dentistry. Extraction and subsequent replacement with osseo- integrated implants should only be considered after all means of retaining the natural tooth have been fully explored[7].

The first step for management of horizontal root-fracture cases is to reposition the tooth and confirm its position radiographically.[1]

LEGENDS

PREOPERATIVE

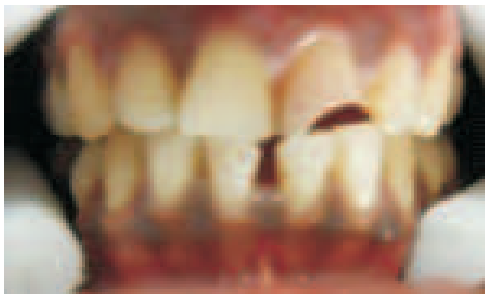

FIG 1: CLINICAL PICTURE

FIG 2: IOPAR -HORIZONTAL FRACTURE IRT 11

OPERATIVE

FIG 3: # SEGMENT REPOSITIONED & STABILIZED WITH FIBER SPLINT

FIG 4 :IOPAR- WORKING LENGTH ESTIMATION

FIG 5 :IOPAR- MASTER CONE SELECTION

FIG 6 : IOPER- POST OBTURATION

FIG 7 : IOPAR- POST SPACE PREPARATION

FIG 8 : IOPAR- FIBRE POST LUTED AS INTERNAL SPLINT

POST OPERATIVE

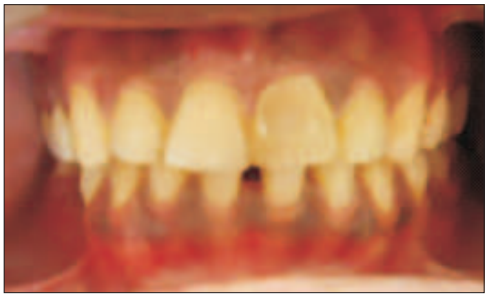

FIG 9 : ESTHETIC MANAGEMENT OF CORONAL STRUCTURES

FIG 10: 6 -MONTH FOLLOW UP RADIOGRAPH

Sequelae to root fractures may be divided into four types, as proposed by Andreasen and Andreasen:[1]

(1) Healing with calcified tissue. Radiographically, the fracture line is discernible, but the fragments are in close contact.

(2) Healing with interproximal connective tissue. Radiographically, the fragments appear separated by a narrow radiolucent line, and the fractured edges appear rounded.

(3) Healing with interproximal bone and connective tissue. Radiographically, the fragments are separated by a distinct bony bridge.

(4) Interproximal inflammatory tissue without healing. Radiographically, a widening of the fracture line and/or a developing radiolucency corresponding to the fracture line becomes apparent.

Use of a post ensures support and stability to the tooth. Traditional metal posts have a high modulus of elasticity,[8] whereas the fiber- reinforced post system has a modulus similar to that of the dentin. The glass fiber-reinforced post has been reported to exhibit high fatigue strength, high tensile strength and a modulus of elasticity closer to dentin than that of carbon fiber-reinforced posts.[9]

Long term clinical studies regarding various treatment options and their prognosis are not available in the literature. The healing of mid-root fractures was described by Cvek et al [10] in a retrospective study of 208 root-fractured incisors, treated with or without external stabilization. Hard- tissue healing of the fragments was observed in 33%, and interposition of PDL alone in 36%, of the teeth. Healing could not be confirmed in 23% of the teeth. Cvek et al.[11] had concluded that the pattern and frequency of healing remains the same, regardless of the location

of the root fracture in relation to the gingival crevice, although the frequencies may vary to some extent. Long-term prognosis of permanent anterior teeth with root fractures is related to the amount of dislocation, stage of root development, and probably whether treatment was done.[11]

CONCLUSION

Horizontal fractures have long been considered to have hopeless prognosis because of poor understanding and lack of availability of materials. Availability of requiside materials like fiber posts, resin lutes have put forth a treatment option for clinicians in the successful management of horizontal root fractures. Though long term clinical trials are required to establish the credibility of this treatment protocol.

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