ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 2, Issue – 1, January - February - 2019, Page No. : 114 - 117

Multidisciplinary Approach in The Management of Cervical Rootfracture: A Case Report

Ratheesh Rajendran[1], Radhakrishnan Nair K[2], Rinsu Nancy Alexander[3], Rakhi santhosh[4], Aadit Anilkumar[5], Deviprasad CS[6]

[1]Senior lecturer Conservative Dentistry and Endodontics, Azeezia Dental College and Research, Kollam, Kerala.

[2]Professor and HOD Conservative Dentistry and Endodontics Azeezia Dental College and Research, Kollam, Kerala.

[3]Post graduate student Conservative dentistry and Endodontics Azeezia Dental College and Research, Kollam, Kerala.

[4]Post graduate student Conservative Dentistry and Endodontics Azeezia Dental College and Research, Kollam, Kerala.

[5]Senior lecturer Conservative dentistry and Endodontics Azeezia Dental College and Research, Kollam, Kerala.

[6]Senior lecturer Conservative dentistry and EndodonticsRajas Dental College, Thirunelveli, Tamil Nadu.

Corresponding Author: Ratheesh Rajendran**,** Senior lecturer Conservative Dentistry and Endodontics, Azeezia Dental College and Research, Kollam, Kerala.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Traumatic injuries to the teeth can occur at any age. If the original tooth fragment is retained following fracture, the natural tooth structures can be reattached using adhesive protocols to ensure reliable strength, durability and aesthetics.Cervical root fractures pose a true therapeutic dilemma to the dental team.In such cases, the prognosis is less favorable because of difficulty in immobilizing the tooth. Repair doesnot occur due to constant movement of the tooth and exposure of the pulp to the oral environment.Clinically, the displacement of the coronal fracture segment is minimal as fractured segments are held together by the underlying periodontal ligament and the remaining radicular segment of the tooth might be partly below the level of the gingiva.Attempts to expose the fracture line by alveolar re-contouring and periodontal procedures may compromise the functional root length and esthetics. Forced orthodontic extrusion is considered as a good treatment option to expose the fracture line, which can produce excellent results. This was first advocated by Heithersay in 1973. The procedure is slow and cumbersome and is indicated in cases where the crown-root ratio would not be compromised after the extrusion.The fragment reattachment is a very conservative treatment which can be considered once fracture line is exposed. It allows the restoration of the original dental anatomy thus rehabilitating function and aesthetics by preserving dental tissues. This case report describes a multidisciplinary approach in management of asubgingivally fractured permanent maxillary lateral incisorunder local anesthesia; the fractured part was carefully separated. After completion of root canal treatment, the root segment was orthodontically extruded and the coronal fragment was successfully reattached with an adhesive tooth reattachment technique.

Keywords: Subgingivally fractured teeth, orthodontic extrusion, reattachment

Introduction

Anterior tooth fractures cause a greater psychological impact on the patient than any other dental disturbance. Incidence of tooth fractures is about 5% and among them root fractures constitute less than 0.5-7%[1].The development of adhesive dentistry allowed dentists to use the patient's own tooth fragment to restore the fractured tooth [2]. As a thumb rule, the prognosis of root fractures depends on the location of the fracture.When a fracture occurs in the cervical third of the root, the prognosis is less favorable because of difficulty in immobilizing the tooth and exposure of pulp to oral environment. Endodontic treatment and restoration of such a tooth is more problematic because of the lack of coronal ferrule and compromised biological width [1,6].

The advantage of reattachment of fractured fragments include immediate esthetics, more reliable outline form, possibility of maintaining the occlusal function, absence of differential wear, lowered economic burden and excellent time resource management. Moreover, the patient's self-esteem remains positive due to maintaining the natural appearance of his teeth. In cervical third root fractures, when fracture plane is apical to the level of alveolar crest, orthodontic extrusion of the root segment can be considered as a treatment option if the crown-root ratio is favorable.This case report details a multidisciplinary management of a subgingivally fractured lateralincisor.The treatment objectives are endodontic treatment of the fractured root, its orthodontic extrusion and reattachment of the coronal segment.

Case report

A female patient, aged 24 reported to the OPD of Conservative Dentistry and Endodontics,Azeezia College of Dental Sciences and Research, Kollam, with the complaint of mobile upper left front tooth due to a trauma 6 months back. Patient was reluctant to do any treatment at that time because the pain subsided after taking pain killers and the tooth was also retained in position. But recently mobility increased and so the patient sought treatment for the tooth. She had no relevant medical history.Clinical examination showed a grade 3 mobile 22 (Figure-1). No fracture line was seen clinically. On probing, there was an attachment loss of 3mm and a discontinuityon the root surface could be felt. Intraoral periapical radiographic investigation revealed a horizontal fracture line 2mm apical to CEJ in relation to 22 (Figure-1). The case was diagnosed to be a cervical third horizontal root fracture in relation to 22.

Figure-1: Root

Treatment Done

Root canal therapy was initiated immediately under local anesthesia. After stabilizing with finger pressure, access opening was done through the fractured segment. Then it was detached and preserved in artificial saliva.The pulp was extirpated and working length radiograph was taken. Cleaning,shaping and obturation were done.A mini implant(8mm length and 1.5mm diameter) was inserted into the canal space of endodontically treated root and luted using glass ionomer type I luting cement. After 1 week, orthodontic traction was applied with a ligature wire from the screw head to the main archwire (19×25 SS rectangular wire).

After 1 month, the required 3 mm of extrusion was obtained. Laser gingivoplasty was done to expose the margins(Fig 2).

Figure-2: Laser gingivoplasty was done to expose the margins

The cemented mini implant was carefully removed.Post space preparation was doneuptopeesoreamer No.3 till an apical 4mm of GP was retained. Fiber post (Tenax) No.13 wasselected inserted through the post space and luted using resin cement. Reshaping of the incisal edge of the stored coronal segment was done to compensate for the added length due to extrusion of the root fragment. With the pulp cavity loaded with dual cure resin composite, the reshaped segment was placed into position and finger pressure was applied until the composite was light cured set(Fig3). Occlusion was evaluated.A check radiograph was recorded to confirm apposition of the two tooth portions (Fig 3). Then the access opening was sealed permanently.

Treatment results

At the end of 24 hours, the postoperative situation was uneventful. Follow up examination at after 1 year showed good gingival healing (Fig 4). On clinical examination, the tooth was completely asymptomatic with no mobility, no tenderness and no further attachment loss. The result was satisfactory.

Figure-3: After 1 year showed good gingival healing

Figure-4:

Treatment Alternatives

Treatment options for elevation of fracture plane included periodontal crown lengthening, flap surgery, osteotomy/ostectomy and rapid orthodontic extrusion [4]. In this case, the length of the root segment was sufficient to support a coronal restoration i.e; the crown: root ratio was favorable. The minimum crown-root ratio is 1: 1, any less support provided by the roots will reduce the prognosis of the tooth and its restoration [5]. Slow, forced eruption is preferred to surgical removal of supporting alveolar bone because it preserves biologic width and, at the same time, provides better CRR [3]. Also, as the radiograph reveals a horizontal bone loss, no other treatment option which could cause additional resection of supporting bone could be taken up. Because of these reasons, we opted for an orthodontic extrusion of the root segment.

Discussion

The location of fracture line affects the treatment options, clinical outcomes, and prognosis of teeth.In this case, as the complete coronal segment of the tooth was intact, fragment reattachment wasconsidered [2,7].After weighing the pros and cons of each treatment option, orthodontic extrusion was opted to elevate the fracture plane so that reattachment can be done.Extrusion is the simplest orthodontic movement because it so closely resembles normal dental eruption. Following a histological assessment, Simon et al. indicated that extrusion of endodontically treated teeth did not present any apparent

problems. They reported that the alveolar housing moves occlusally as the tooth is extruded followed by bone deposition at the alveolar crest and throughout the interradiculararea[10].Biggerstaff et al found that using 20-30g of eruptive force resulted in eruption with alveolar crestal new bone formation[9] Additional reinforcement was given by the use of fiberpost.Reinforcing with tooth-colored fiber posts have several advantages[6,8]like more esthetics and even stress distribution.

Conclusion

Cervical root fracture is a difficult clinical situation to be managed. Orthodontic extrusion can be considered as a treatment option in such cases provided the crown-root ratio is favorable. Reattachment of natural tooth fragment can give better esthetics compared to the artificial restorations. Also, insertion of flexible fiber post reinforces the tooth against functional forces. Reattachment proved to be a successful technique in this case for restoring esthetics and function. However, because few long term studies have been reported in literature, the patient should be informed of possible interim nature of the treatment.

References

1. Grossman's Endodontic Practice. 13th ed
2. Reis A et al. Reattachment of Fractured Teeth: A Review of the Literature.OperativeDentistry, 2004, 29-2, 226-233.
3. Grossman and sadan.The prosthodontic concept of crown-to-root ratio: A review oftheliterature.Journal of prosthetic dentistry 2005, 93(6)
4. Mittal R, Gupta S, Singla A, Gupta A. Managing sub-gingival fracture by multi-disciplinary approach: Endodontics-forced orthodontic extrusion and prostheticrehabilitation. Saudi Endod J 2013;3:82-6.
5. Verma KG, Juneja S, Kumar S, Goyal T. Orthodontic extrusion of subgingivally fracturedtooth using a removable appliance: An alternative treatment to reestablish biologicalwidth. Indian J Dent Res 2014;25:678-80
6. Devanna R, Hegde V, Kavitha V. Management of subgingivally fractured teeth: Amultidisciplinary approach. J Interdiscip Dentistry 2011;1:49-54
7. Kavitha T et al. Reattachment of fractured tooth fragments using custom-fabricateddowel. Endodontology 2000(12)
8. Tosun G et al. Reattachment of fractured maxillary incisors using fiber-reinforced post:two case reports. European journal of Dentistry April 2012 (6)
9. Biggerstaff RH, Sinks JH, Carazola AL. Orthodontic extrusion and biologic widthrealignment procedures: methods for reclaiming nonrestorable teeth. JADA 1986;112:345-8.
10. Simon JHS, Lythgoe JB, Torabinejad M. Clinical and histologicalevaluation of extrudedendodontically treated teeth in dogs. OralSurg Oral Med Oral Pathol 1980;50:361-71.