ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 07, pp.35114-35117, July, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

AN ESTHETIC APPEAL TO THE TREATMENT OF AN OBLIQUE CROWN ROOT FRACTURE– A CASE REPORT

***Dr. Roopa Patil, Dr. Sonal Joshi, Dr. Neha Dhaded and Dr. Shantesh, M.**

Department of Conservative Dentistry and Endodontics, KLEVKIDS, Belgaum

ARTICLE INFO

Article History:
Received 14th April, 2016
Received in revised form
23rd May, 2016
Accepted 20th June, 2016
Published online 31st July, 2016

Key words:
Trauma,
Esthetic Treatment,
Forced Eruption,
Subgingival Fracture,
Multidisciplinary Management.

ABSTRACT

Fractured anterior tooth with a fracture line extending subgingivally poses multiple problems to clinicians. Since it requires exposure of sound tooth structure to achieve proper finish line for restoration, it is necessary to elevate the fracture line above the epithelial attachment. Orthodontic forced eruption is suitable approach for extrusion of tooth, without disturbing esthetics, in cases where fracture line is extending below gingiva or alvelor bone crest. Conventional orthodontic appliance is unappealing due to brackets. This case report describes a novel approach to establish not only long term restorative success but also immediate dental esthetics, using modified cast post with hook and labial acrylic veneer attached to it so that the patient is able to smile with confidence during course of treatment.

Citation: Dr. Roopa Patil, Dr. Sonal Joshi, Dr. Neha Dhaded and Dr. Shantesh, M. 2016. "An esthetic appeal to the treatment of an oblique crown root fracture–a case report", *International Journal of Current Research*, 8, (07), 35114-35117.

INTRODUCTION

Tooth fractures comprise of 26-76% of total dental injuries in the permanent dentition, of these the teeth that mostly affected are the maxillary incisors due to their anterior and protruded position in the oral cavity (Kumar, 2010). As these teeth are major components in the oro-facial aesthetics, their fracture is of immense psychological trauma for the patient; moreover, it requires immediate attention.There are several treatment modalities for aesthetic and functional rehabilitation in cases of crown-root fracture such as post core crowns, gingivectomy/gingivoplasty, osteoplasty and orthodontic extrusion. The choice of treatment depends primarily on the level of fracture line, either supra or subgingival. The prime objective of tooth extrusion or forced eruption by orthodontic movement is to provide both a sound margin final restoration to create and to maintain healthy periodontal environment (biological width). The amount of extrusion would normally take about 2–4 months time to expose the fracture line. During this period, it is difficult to maintain esthetics in the anterior region which is an area of concern.

****Corresponding author: Roopa Patil,***
Department of Conservative Dentistry and Endodontics, KLEVKIDS, Belgaum

Moreover, the exposure of the orthodontic metal brackets, while patient opens the mouth becomes an esthetic concern of already fractured tooth during the course of treatment (Arunajatesan Subbiya *et al*., 2011). This case report describes in detail the multidisciplinary management of subgingivally fractured incisor tooth.

Case report

A 28 yrs old lady reported with a chief complaint of broken upper front tooth 1 month prior to her visit to the department. She gave history of trauma due to a fall with a mild continuous pain. The patient's medical and family history was non contributory. There were no abnormalities in the hard and soft tissues on extraoral examination. On intraoral examination, tooth no.12 was fractured. Clinical examination revealed complicated crown fracture i.e., fracture involving enamel, dentin, cementum and pulp with tooth 12 and Ellis Class I fracture with tooth 11(Figure 1 & 2 .)The margins were 1.5 mmsupragingivally on the labial side and **2**mm subgingival on palatal side (Figure 3).

Since patient insisted on immediate replacement of the fractured teeth, the following treatment available options were explained to the patient which included:

- Orthodontic extrusion of the remaining portion tooth and eventual restoration.
- Crown lengthening by surgical means and eventual restoration
- Extraction of the residual tooth and immediate implant surgery or/ extraction followed by bridge.

Figure 1. Ellis Class III Fracture with tooth 12 and Ellis Class I Fracture with tooth 1

Figure 2. Radiograph showing Ellis Class III Fracture with tooth 12 and Ellis Class I Fracture with tooth 1

Figure 3. Palatal view of tooth 12

Among the treatment options, the patient opted for orthodontic extrusion of remaining portion of tooth and restoration and informed consent was taken. A conservative access opening was prepared as suggested by Ingle *et al*. Pulp was extirpated using no 10 K file and working length determination was done using Ingle's method. Cleaning and shaping was done with protaper universal system in 16:1 gear reduction torque controlled endomotor (Rotary master, Morita, USA) according to manufacturer's instructions till F4 size and obturation was done using protaper gutta-percha. The patient was recalled after a week for post endodontic restoration.

The post space was prepared upto12mm using peeso reamers of size 1, 2 and 3 (Mani- Prime Dental Products). With increasing demand for esthetics, modified cast post with a hook and a acrylic veneer (DPI-RR Cold Cure) attachment was fabricated (Figure 4).

Figure 4. Modified cast post with hook and acrylic veneer

A mini implant of size 9 mm in length and 1.5 mm in diameter was placed in the mandibular arch between the roots of lateral incisor and canine. Approximately 6mm of the implant was placed inside the bone (Figure 5 & 6). Implant was placed directly in line with the long axis of the tooth and the hook for attachment of elastic would fall in line with crest of the tooth and would avoid any undesirable movement. The region of implant placement was inconspicuous and without disturbing esthetics. Post(Nordin, H Nordin SA, Chailly) was cemented using type I GIC (GC Corporation, Tokyo, Japan). The disadvantage of this method is that it is invasive procedure and technique sensitive. The success depends on oral hygiene maintenance.

Figure 5. Placement of Implant

Figure 6. Radiograph showing placement of Implant

The patient was advised to wear the elastics for a minimum period of 4 hrs daily, by engaging the elastic in the implant and the hook, resulting in pulling force which translates to extrusion of tooth (Figure 7). During every appointment the acrylic veneer was adjusted by trimming it to compensate for the amount of extrusion. After 8 weeks, 4mm of extrusion was observed (Figure 8). The hook of cast post was trimmed off and tooth was prepared and metal fused to ceramic crown was cemented with dual cure resin cement RelyX U100 [3M ESPE](Figure 9).

Figure 7. Extrusion of Tooth

Figure 8. 4mm of Extrusion observed

Figure 9. Metal fused to ceramic crown with tooth 12

DISCUSSION

One of the determinant factors for the functional and aesthetic success in the management of complicated crown-root fractures is the adoption of a multidisciplinary approach (Poi *et al*., 2007). The literature shows that the restoration of teeth with crown-root fracture is usually challenging, especially when the fracture extends below the crestal bone level as occurred in the present case (Koyuturk and Malkoc, 2005). Different treatment strategies have been proposed for the management of complicated crown-root fractures including surgical exposure of the fractured surface, orthodontic or surgical extrusion of the apical fragment, intentional replantation and tooth extraction in more severe cases (Eden *et al*., 2007; Emerich-Poplatek *et al*., 2005; Poi *et al*., 2007; Nandlal and Daneswari, 2007; Wang *et al*., 2000). In the present case orthodontic extrusion was chosen as the line of treatment to re-establish the lost biological width as it is considered as the safe procedure with respect to the occurrence of root resorption and does not involve loss of periodontal support of the surrounding teeth, which favors aesthetics (Bach *et al*., 2004; Benenati and Simon, 1986; Heithersay, 1973). Stern and Becker discussed orthodontic extrusion as an esthetic alternative to surgical crown lengthening and lowering of the alveolar crest 2-3mm.They suggested that with an extrusive force, there was additional bone deposition lining the socket. Unlike other orthodontic procedures, in extrusion, bone resorption does not occur. Bundle bone is replaced by lamellar bone (Stern and Becker, 1980).

Orthodontic extrusion can be done in various methods:

- Using removable appliance.
- Fixed appliance.

Disadvantage of removable appliance is that there is no rigidity to get fixed onto the tooth to be extruded. Hence they are not very effective. Placement of attachment device as given in fixed appliance on the tooth does not exactly fall in line with crest of the tooth and this causes unwanted tilting or tipping of the tooth. Moreover, the teeth which are used as anchorage will experience some force and may undergo undesirable movement. Fixed appliances can also interfere with the facial esthetics of the patient. There are problems even with lingual orthodontic extrusion such as discomfort, difficulties in cleaning their teeth, chewing, swallowing, talking and cost of treatment. Skeletal anchorage is now under the line light in the current orthodontic practice. Skeletal anchorage provides almost absolute anchorage by means of mini implants or minis crews.

They are widely used as temporary anchorage devices. Besides their ease of use and versatility they can be placed almost anywhere on the cortical plate with a minimum of 5mm bone thickness. They are self threading and offer mechanical retention through the bone. Mini implant was chosen for skeletal anchorage. It is used just as temporary anchorage devices, but research in this field is still in its infancy. Advantages of mini implants include minimal anatomic limitations, minor surgery, increased patient comfort, immediate loading and lower costs (Berens *et al*., 2005; Miyawaki *et al*., 2003; Costa *et al*., 1998; Freudenthaler *et al*., 2001).

To enhance esthetics, acrylic veneer was attached to cast post and hook assembly. Considering the time elapsed to follow up, the extension of fracture line, the amount of remaining root portion and patient's age, the present treatment plan was proposed. A combination of modified cast post and core with a labial veneer attached to it and orthodontic root extrusion has provided good functional and aesthetic outcomes. Clinical examination and radiographs showed satisfactory results during follow up which demonstrates the importance of establishing a multidisciplinary approach for a successful aesthetic management of dental trauma.

Conclusion

Modified cast post with labial veneer attachment and mini implant placed in mandibular arch is a novel approach to establish long term restorative success by immediate replacement of esthetics for a fractured tooth which helped the patient to smile confidently during course of treatment.

REFERENCES

Arunajatesan Subbiya, Radhakrishnan Venugopal Murali 2011. *Management of Subgingival Fracture by an Esthetic Approach. Journal of Conservative Dentistry* 3, 318-321.

Bach, N., Baylard, J.F., Voyer, R. 2004. *Orthodontic extrusion: periodontal considerations and applications. J Can Dent Assoc* 70,775–80.

Benenati, F.W., Simon, J.H.S. 1986. *Orthodontic root extrusion: its rationale and uses. Gent Dent.,* 34,285–9.

Berens, A., Wiechmann, D., Radiger, J. 2005. Int Orthodo 3,pp. 235-243.

Costa, A., Raffini, M. and Melson 1998. *Miniscrews as orthodontic anchorage: a preliminary report. Int J Adult orthod orthognathic surgery*, 13, 201-209

Eden, E., Yanar, S.C. and Sonmez, S. 2007. *Reattachment of subgingivally fractured central incisor with an open apex.* Dental Traumatology 23,184–9.

Emerich-Poplatek, K., Sawicki, L., Bodal, M. *et al*. 2005. *Forced eruption after crown/root fracture with a simple and aesthetic method using the fractured crown.* Dental Traumatology 21,165–9.

Freudenthaler, J.W. Haas, R. and Bantleon, H.P 2001. *Biocortical titanium screws for critical orthodontic anchorage in mandible: a preliminary report on clinical applications. Clin Oral Implants Res.,* 12, 358-363.

Heithersay, G.S. 1973. *Combined endodontic-orthodontic treatment of transverse root fractures in the region of the alveolar crest*. *Oral Surg Oral Med Oral Pathol*., 36,404–415.

Koyuturk, A.E. and Malkoc, S. 2005. *Orthodontic extrusion of subgingivally fractured incisor before restoration. A case report: 3-years follow-up.* Dental Traumatology 21,174–8.

Kumar, A. 2010. *Reattachment of Fractured Tooth Using Self Etching Adhesive and Esthetic Fiber Post*. Journal of Dental Sciences & Research 1,2-3

Miyawaki, S., Koyama, I., Inoue, M. and Mishima, K. 2003. *Factors associated with stability of titanium screws placed in post region for orthodontic anchorage. Am J. Orthod Dentofacial Orthop* 124,373-78

Nandlal, B., Daneswari, V. 2007. *Restoring biological width in crownroot fracture: a periodontal concern. J Indian Soc Pedod Prev Dent.,* 25(Suppl),S20–4.

Poi, W.R., de Cardoso, L., de Castro, J.C. *et al*. 2007. *Multidisciplinary treatment approach for crown fracture and crown-root fracture – a case report.* Dental Traumatology 23,51–5.

Poi, W.R., de Cardoso, L., de Castro, J.C. *et al*. 2007. *Multidisciplinary treatment approach for crown fracture and crown-root fracture – a case report.* Dental Traumatology 23,51–5.

Stern, N. Becker 1980. *A forced eruption: biological and clinical considerations. J Oral Rehabili*., 43,401-7.

Wang, Z., Heffernan, M., Vann, W.F. Jr 2000. *Management of a complicated crown-root fracture in a young permanent incisor using intentional replantation. Dental Traumatology,* 24,100–3.

****