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 – 3, Issue – 3, May - 2020, Page No. : 82 - 86

Management of Ellis fractures: A Novel Approach

[1]Amrutha Sathianath, Department of Conservative dentistry and Endodontics, JSS Dental College and Hospital,JSS Academy of Higher Education and Research, Mysore,Karnataka ,India

[2]Sunil Tejaswi, Department of Conservative dentistry and Endodontics, JSS Dental College and Hospital,JSS Academy of Higher Education and Research, Mysore,Karnataka ,India

[3]Ganesh S, Department of Conservative dentistry and Endodontics, JSS Dental College and Hospital,JSS Academy of Higher Education and Research, Mysore,Karnataka ,India

[4]Suneeth Shetty, Department of Conservative dentistry and Endodontics, JSS Dental College and Hospital,JSS Academy of Higher Education and Research, Mysore,Karnataka ,India

Corresponding author: Amrutha Sathianath, Department of Conservative dentistry and Endodontics, JSS Dental College and Hospital,JSS Academy of Higher Education and Research, Mysore,Karnataka ,India

Citation of this Article: Amrutha Sathianath, Sunil Tejaswi, Ganesh S,Suneeth Shetty, " Management of Ellis fractures : A Novel Approach", IJDSIR- May - 2020, Vol. – 3, Issue -3, P. No. 82 – 86.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

A 30-year-old male patient with Ellis fractures to maxillary incisors with one showing a crown fracture with palatal fragment hanging was reported on upper right lateral incisors and was treated by fragment reattachment. A crown fracture that involves enamel (Ellis class I) was noted on upper right central incisors which were treated by direct composite build up. Fracture of root with fracture of the crown (Ellis class VI) was noted on upper left central incisors which had a poor prognosis and were advised for extraction. Root canal treatment with fiber post was carried out on the upper left lateral incisors (Ellis class III). An innovative method was used to reattach the tooth fragments whereby using IVOCLAV Multilink N. Follow-up visits confirmed the success of treatment based on clinical and radiographic evaluations. The patient was pain-free with no tooth sensitivity and good function and esthetics after two years of follow-up.

Keywords: Fragment reattachment, Ellis Fracture, Multilink speed, Root Canal.

Introduction

One of the most commonly seen dental traumatic injury is a crown fracture of anterior teeth which affect both children and adolescent which has a prevalence rate of 58.6%. Several factors can involve in the management of coronal fractures including the extent of fracture biological width violation, endodontic involvement, alveolar bone fracture, restorability, secondary trauma injuries, presence/absence of fractured tooth fragment and its fit between a fragment and the remaining tooth

structure, occlusion, esthetics, and prognosis. Managing coronal tooth fractures when the tooth fragment is available is by the reattachment of the dental fragment. Reattachment of fractured tooth fragments can provide good and long-lasting esthetics because the tooth's original anatomic form, color, and surface texture are maintained. It also restores function, provides a positive psychological response, and is a relatively simple procedure. [1,2,3]

Case Report

A 30 years old male patient reported to the department of conservative dentistry and endodontic with a chief complaint of badly broken down front tooth due to traumatic injury. The patient had a cervical spine injury during the accident and was wearing a semi-rigid cervical collar to prevents potentially harmful movements of the cervical spine. On extra examination, trauma to the soft tissues was identified lip lacerations which were sutured.[4,5]

On intraoral examination, Upper right lateral incisors with fragment hanging palatally were noted.OPG shows no periapical radiolucency fragment was extracted from the tooth surface a pinpoint exposure was present which was done direct pulp capping using biodentin and the removed fragment was kept in 2% chlorhexidine for 1minute and rinsed with saline and reattachment was done using ivoclav multi-link N a self-etch adhesive cement. Multilink N seals the dentin and ensures marginal integrity and high bond strength on enamel and dentin, which is attained in only ten minutes. The fragment and tooth were etched with 37% phosphoric acid beyond the margins for 15 seconds and rinsed with air/water spray. After being dried, primerA and B was mixed and applied to the fragment surface and two layers of the adhesive(Monobond) were applied and mild air jets were applied until a shiny appearance was observed on the tooth surface. The tooth fragment was positioned and stabilized with an increment of Multilink N flowable composite. After light curing for 20 sec using Light curing unit excellent adaptation was observed with the repositioned tooth fragment.

Multilink N-The universal luting composite system Multilink N is suitable for the adhesive cementation of metal, metall-ceramic, all-ceramic and composite resing restorations.

The luting composite and self-etch adhesive (Multilink N Primer) of the Multilink N-System are specially co-ordinated. The self-etch adhesive seals the dentin and ensures marginal integrity and high bond strength on enamel and dentin, which is attained in only ten minutes. It provides the basis for a strong and lasting bond.

Advantages

Strong and long-lasting bond

Universal application

Easy clean-up of excess cement

Indications

The universal luting composite is suitable for the placement of indirect restorations made of leucite-reinforced glass-ceramics (IPS Empress), lithium disilicate glass-ceramics (IPS e.max CAD/Press), composite resins (FRC Postec Plus, SR Nexco), oxide ceramics (IPS e.max ZirCAD), metal and metal-ceramics (IPS 99, IPS InLine System). Multilink N is used for the following indications, depending on the material used:

Inlays/Onlays

Crowns

Bridges

Root posts

Shades

Transparent, Yellow

A crown fracture which involves enamel (Ellis class I) was noted on upper right central incisors which were treated by direct composite build up. Root canal treatment

with fiber post was carried out on the upper left lateral incisors (Ellis class III). Fracture of root with fracture of the crown (Ellis class VI) was noted on upper left central incisors which had a poor prognosis and was advised for extraction and were replaced by a fixed partial denture.

Discussion

The development of adhesive restorative materials has provided new perspectives for the treatment of fractured teeth. Thus, fragment reattachment becomes a fast, simple, and conservative technique that provides excellent rehabilitation of the esthetics and function. It also provides feasible and favorable long-term results, the dental clinician needs to have knowledge of the materials and follow the correct treatment protocol. (7,8,9)

Dehydration of the fragment may result in a change in dental color and a decrease in the fracture strength of the tooth. Proper rehydration of the fragment has the capability of restoring both color and strength.

In the case presented, the fragment was well adapted, and for this reason, there was not any additional preparation. We opted for the use of resin cement and not composite resin, considering that the shade, viscosity, and dual-cure mechanism of these types of cement facilitate the insertion and polymerization reduction.(10)

The advantages of fragment reattachment are as follows:

- It offers faithful reproduction of the shape, contour, and texture of the natural tooth;
- It offers unchanged color and optical characteristics; and
- It is a predictable, quick, conservative, and low-cost method.

The disadvantages of fragment reattachment are as follows:

- It may result in a change in color due to inadequate rehydration of the fragment
- It carries the possibility of detachment of the fragment.

Conclusion

Periodic follow-up was done to perform clinical, radiographic, and periodontal examinations, as well as pulp vitality tests, was done to ensure the integrity, the esthetics, and the functional health of the fractured element. Successful results were shown the patient was pain-free with no tooth sensitivity and good function and esthetics after two years of follow-up.

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Legends Figure

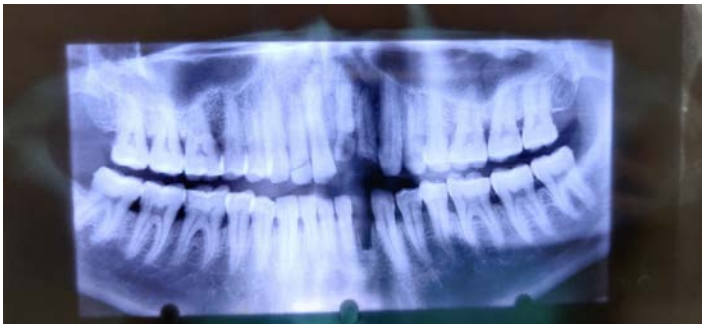

Figure 1: Pre operative radiograph showing ellis fractures

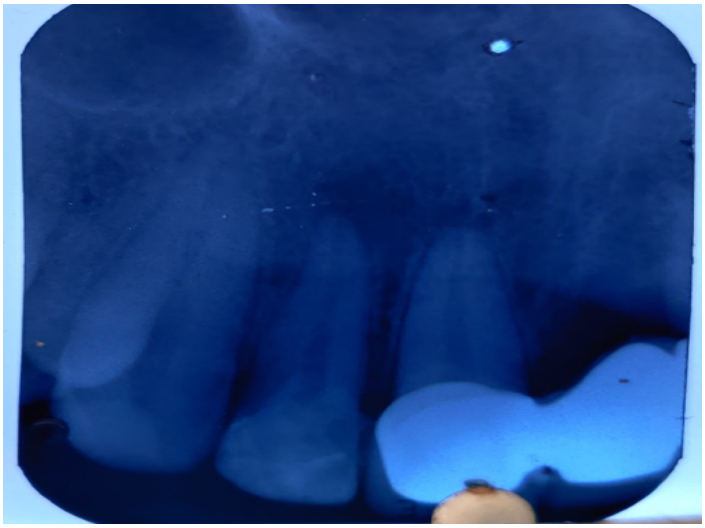

Figure 2: Radiograph after 2 years follow up showing no evidence of lesion and patient asymptomatic

Figure 3: Pre operative photograph showing ellis fracture

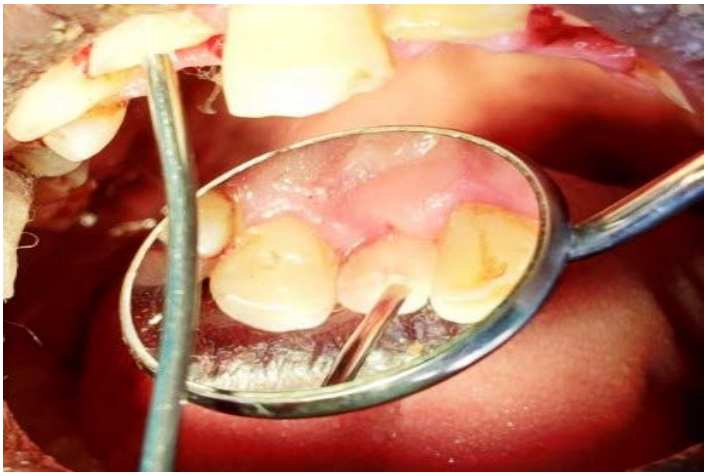

Figure 4: Application of biodentin

Figure 5: Tooth fragment

Figure 6: After reattachment

Figure 7:Post operative image

Figure 8