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INTRODUCTION

The most common type of acute dental injury is crown fractures of anterior segment of teeth mostly affect adolescents and children.¹ Fracture of anterior teeth is frequently as a result of (RTA) road traffic accidents, contact sports and falls. During traumatic injury, Loss of tooth structure and Fracture particularly in the anterior segment could produce esthetic and psychosomatic impact on patient as well as parents.² The incidence of dental trauma has revealed significantly different ranges from 6% to 34%.³

Classification of Crown fractures by Andreasen is an enamel infraction, enamel fractures with little or no dentin involvement, enamel-dentin fractures without pulp involve known as uncomplicated crown fractures, and enamel dentin fractures along with pulp that's known as complicated crown fractures.⁴ different methods and techniques are designed in used to restoring fractured teeth are pin retained resin, composite filling with and without pins, stainless steel crowns, porcelain jacket crowns, orthodontic bands, complex ceramic restorations^{3,5,6} and in few cases

FRACTURED MAXILLARY CENTRAL INCISORS; RESTORATION WITH PINS RETAINED RESTORATION: 2 CASE REPORTS

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ABSTRACT: Fractured incisors are restored with composite resin is a routine procedure. The retention of composite restoration is related to the bond strength of adhesive and the surface area existing for bonding. In absence of adequate bonding areas in fractured tooth of younger individuals with resilient dentin, additional retention through placement of self threaded pins will give the required support and maintain esthetics. additional retentive means, in the form of pins are often required for restoration of damaged and broken tooth, particularly in adolescent patient's teeth where pulp chamber is comparatively large, dentinal tubules are relatively immature and still gingival lines are high. The threading acts scatter and devour some of the placing energy by cutting part of pin channel in the dentinal walls. This case report fuses the retentive feature of self threaded pin with the esthetic advantage of composite restoration in fractured anterior teeth.

Key words: Coronal fracture of anterior teeth, Self Threaded pins, Retention.

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extraction of tooth and replacement.^{2,7} Commonly excessive loss of tooth structure depends upon either cleaning a big cavity or effect of a trauma, in order to get sufficient adhesion and durability by using one or more pins to dentine. Traditionally dentin pins is not only used to increase the adhesion of large restoration, but also increase the adherence of core tooth structure in the prosthetic therapy.⁸

There are three types of pins 1.cemented, 2.friction-locked, 3.self-threading pins. Self-threading pins are primary pins in current use, these pins are more retentive in dentin than other pins. Recommended depth of Self-threading pins in dentin is 2.0 to 3.0 mm. Self-threading pins direct insert in dentin and screwing to dentin slot. Diameter of dentine space is lesser than pin diameter among 0.0038 and 0.10 mm. flexibility of dentin tolerating the pin to fit into dentine space which is lesser than itself. Fitting of additional pin into, the additional grooves on the pin and dentin gripping each other and the self-threading pin delivers best adherence. But moreover, these pins could develop both horizontal and

vertical stresses on dentine. A single benefit of standard pin is diminished the stress in apically pin space by reversed in half or quarter. Pins with disposable plastic head fit a geared-down slow speed contrangle hand-piece. At the point where there is resistance for more threading, i.e., pin touches the bottom of space, plastic head will break from pin.⁸

The benefits of pins restoration are accommodating at one sitting and enhance the durability of restorations.

CASE REPORT 1

A 14 years old male patient reported to the Department of Conservative Dentistry & Endodontic, with a chief complaint of fractured upper both right and left front teeth. (Figure-I&II) He reported an incident at home wherein a fall while playing had injured his both front teeth.

On clinical examination:



Figure-I. Pre-operative view



Figure-II. Pin Placement done

Patient had no external swelling or hemorrhage. There were no fractured pieces of teeth were

determined on inner side of the lips, on tongue and sublingual parts in intraoral examination of patient. Patient had no pain in relation to maxillary both right and left central incisors and teeth had no tenderness on vertical percussion.

On vitality test: Electric pulp test and thermal tests were performed in relation to the maxillary anterior. Positive response was observed in both upper right & left central incisors and involved both teeth showed no signs of mobility. Radiographical showed no Periapical Radiolucency was seen and there was no pulpal exposure. No bone loss was observed, hence needed conservative restoration. One dentin pin for each tooth was placed on dentin surface (fig 2). The pins were enclosed with fluent composite. Then, the transparent matrix bands were adapted to mesial and distal edges of teeth and were fastened with appropriate wedges. Afterwards, phosphoric acid gel and bonding agent were applied to enamel surfaces and restored using composite resin by layering techniques. Finally, the restoration surfaces were polished with finishing discs. (Figure-III&IV)

The treatment is completed with all aesthetic and functional needs. In addition, the patient has been given the oral hygiene instructions that he should care about fractured anterior both central incisors.

CASE REPORT 2

A 17 years old male patient reported to the Department of Conservative Dentistry and Endodontics, with a chief complaint of fractured upper right front tooth. (Figure-I)

He reported sports injury involving his front tooth. On clinical examination:

Patient had no external swelling or hemorrhage. There were no fractured pieces of teeth were determined on inner side of the lips, on tongue and sublingual parts in intraoral examination of patient. Patient had no pain in relation to maxillary right central incisor and teeth had no tenderness on vertical percussion.

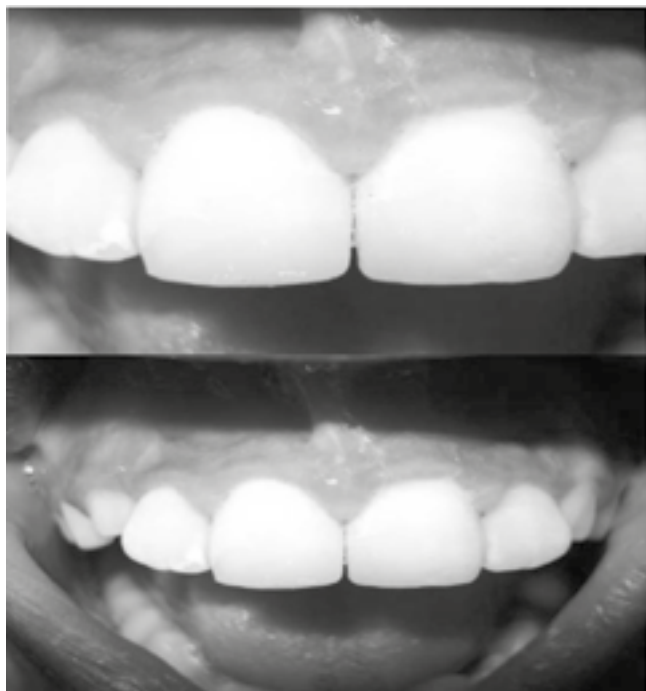


Figure-III & IV. Post operative view Restored with composite restoration



Figure-I&II. Pre-operative view

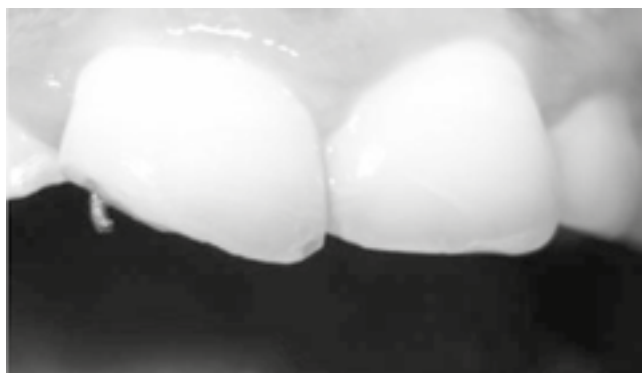


Figure-III. Pin Placement done

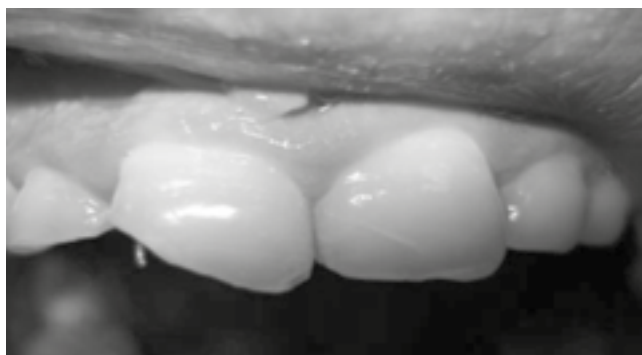


Figure-III. Pin Placement don



Figure-IV. Restored with composite Restoration.

On vitality test: Electric pulp test and thermal tests were performed in relation to the maxillary anterior. Positive response was observed only in relation to upper right central incisor and involved tooth showed no signs of mobility. Radiographical showed no Periapical Radiolucency was seen, and there was no pulpal exposure. No bone loss was observed, hence needed conservative restoration. One pin was placed on dentin surface (figure-III&IV).The pins was enclosed with fluent composite (figure-IV). Then, the transparent matrix band was used to build up the distal marginal ridge and shape of the tooth. Afterwards, phosphoric acid gel and bonding agent were applied to enamel surfaces and restored using composite resin by layering technique. Finally, the restoration surfaces were polished with finishing discs. The treatment is completed with all aesthetic and functional needs. In addition, the patient has been given the oral hygiene instructions that he should care about.

DISCUSSION

Mechanically dentinal pins are fixed firmly to materials with screws.

If adjustment of dentin pin to restorative material is insufficient, subsequently weakening restoration. If the expansions coefficient among restorative material and pin or polymerization contraction of filling material are not same, it presents of leakage which is corrosive and abrasive among restorative material and pin, it can cause reduce bond strength.⁸ Appearances of upper anterior teeth are most vital area requires immediate treatment not only dental esthetics but also in the direction of facial esthetics. The objective is to restoring the upper anterior teeth in conformity with the contiguous tissues and facial profile. As different treatment methods have been designated for fractured teeth.⁹ Choice of treatment option depends on the size of fracture, site of fracture, involvement of pulp, periodontal status and root formation.¹⁰ Although adhesive technology has gone huge progress in the last decade, nevertheless bond to the dentin until remains challenging. Unsuccessful adhesive is still an exacting risk for restoration.¹¹

In this case reports, dentin pins were found to intensify the retention of the composite restoration with the tooth structure.

Macro-mechanical retention contributed by dentin pins occupied a major role in this case. Self-threading pin produces more retention than the cemented pin inserted to the same depth in dentin.¹² suggested channel depth for cemented pin up to 5 mm, and 2mm channel depth is for self-threading design pins.¹³ Mainly self-threading pin now recommends a range of pins differing diameters. In some cases where the pin is movable, it could be feasible to using a larger-diameter pin, any with or without additional adjustment of the channel. Such adjustments generally consist of enlarge channel with the appropriate-size swirl drill to permit fresh pin to hold satisfactorily. By this to allow operator for using a large pin if desired. Another advantage by this approach is use of smaller-diameter pins produce small dentin stress around the channel; reduce the risk of crack produce in the surrounding dentin.¹⁴

CONCLUSION

Placement of pin is challenging and needs skills. Various problems may occur during the procedure, and success often depends more on the dentist skill and decision than on the particular pin used. Selection of suitable pin should be depends upon skill and experience of the operator and factors, like suitable pin size, appropriating distance remains with the arc should be taken into description when making choice. Currently various adhesive resins are used to increase the retention of pins. Nevertheless, a lot of clinical cases have different output but aesthetics is definitely satisfactory in these cases.

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“The life of the nation is secure only while the nation is honest, truthful, and virtuous.”

Frederick Douglass



AUTHORSHIP AND CONTRIBUTION DECLARATION

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