MANAGEMENT OF SUBGINGIVAL FRACTURE - A CASE REPORT

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Trauma with accompanying fracture of permanent anterior teeth is a tragic experience for the young patients and create psychological impact on them. Crown fracture accounts for the highest percentage of all traumatic injury in the permanent dentition. The clinician plays a vital role in the prognosis of traumatized tooth. It depends on his accurate diagnosis and treatment procedure at two separate levels; the pulpal and the restorative level. This case report describes the management of subgingival fracture in an upper left canine.

Key Words - Trauma, subgingival fracture, clinical crown-lengthening.

Crown fracture accounts for the majority of all traumatic injuries in the permanent dentition (26 92% of dental injuries), while crown root fractures represents only 0.3 - 5%.[1] The management of traumatic injuries is the constant source of difficulty for clinicians because of complexity of diagnosis and treating the injury properly.[2] Depending upon the type and severity of injury, treatment may involve endodontic, surgical, restorative and prosthodontic procedure.[3]

This case report outlines the management of subgingival fracture, Ellis class III and classification S.02.52, fracture of crown with pulpal involvement (application of international classification of disease to dentistry and stomatology, WHO 1995).[1]

Case report

A boy aged about 17 years reported to the department of Conservative Dentistry and Endodontics, Kothiwal Dental College and Research Centre, Moradabad.

The patient complained of fracture of upper left canine while playing cricket in the school. He gave history of trauma one month back and he had visited a local dentist, where he had undergone pulpectomy of the fractured tooth. Due to the cost factor the patient was unable to continue the treatment.

On general examination, the patient was apparently healthy with no contributory medical history. Clinical examination revealed subgingival fracture with 23. The gingiva around the tooth was inflamed.[fig.1] Radiographic examination revealed a horizontal tooth fracture of 23 at the cervical level. There was no damage to the adjacent tooth.

On the basis of clinical and radiographic findings it has been diagnosed Ellis class III fracture and classification S.02.52, fracture of crown with pulpal involvement (application of international classification of disease to dentistry and stomatology, WHO 1995).

A definitive treatment plan was made as follows- clinical crown lengthening, endodontic treatment, post and core, and a ceramic jacket crown. The patient was advised of the treatment plan and informed consent was taken.

Considering the biological width, the crown lengthening procedure was performed under local anesthesia to expose a greater height of tooth structure for isolation and in order to properly restore the tooth. [fig.2]

Endodontic treatment of the fractured tooth was carried out and post space was prepared as per the

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Fig. 1



Fig. 2



Fig. 3



Fig. 4

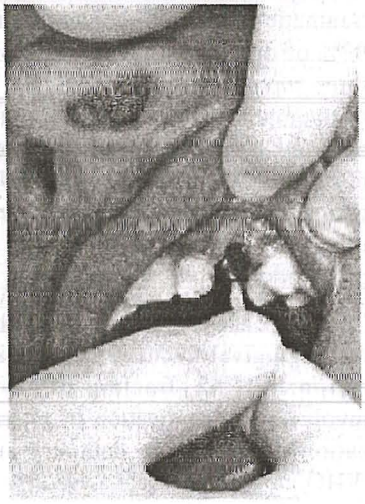


Fig. 5

protocol. (Fig .3&4).Post and core was fabricated and cemented (fig.5&6). Finally a ceramic jacket crown was delivered. (Fig. 7).

Discussion

Cervical fractures have immediate implication for endodontic, restorative and periodontal prognosis, due to the line of fracture which is subgingival. Treatment objective must therefore be aimed at exposing fracture margins juxtagingivally or supragingivally, so that all the clinical procedure can be managed with strict moisture control and bleeding control.[1]

Clinical crown lengthening (CCL) refers to procedures designed to increase the extent of supragingival tooth structure for restorative or esthetic purpose. From endodontic point of view CCL enhances tooth isolation with dental dam, without the problem of leakage of either saliva or blood

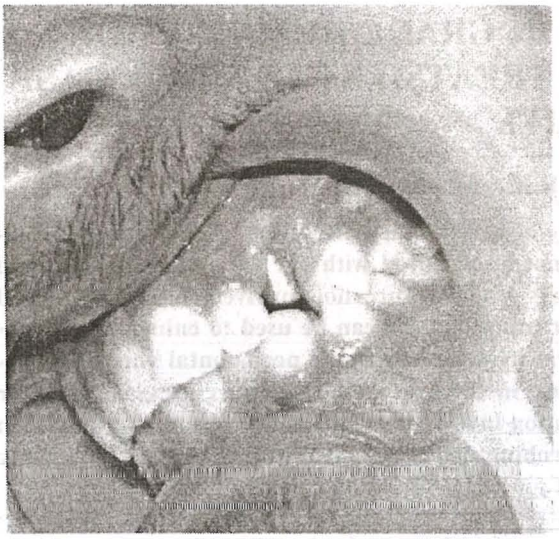


Fig. 6

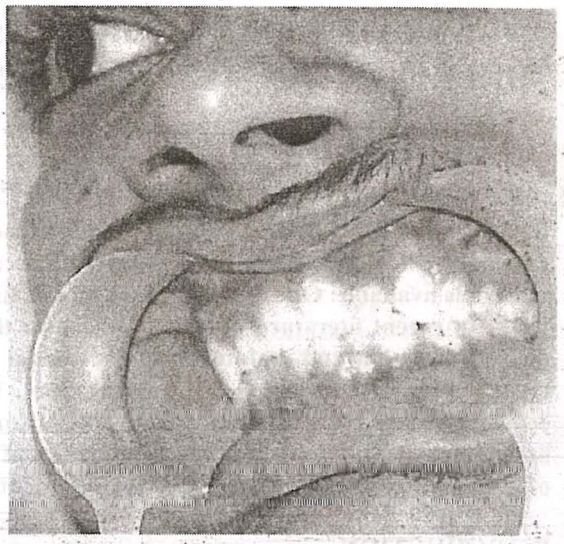


Fig. 7

into the operating field or irrigants into the oral cavity.[4]

In the present case, we observed a horizontal subgingival fracture of the tooth. The CCL procedure was carried out considering the biomechanical properties like, Biological width, Ferrule effect and Crown to Root ratio.

Biological width and biological zone refers to the minimum dimension of the space between the most coronal level of the alveolar bone and the bottom of the gingiva respectively. This is the minimum space needed for the tissue to maintain their integrity in a healthy status. Violation of this space results in inflammation and eventually loss of periodontal support.[5] Ferrule effect in respect to teeth is a band that encircles the external dimension of residual tooth structure, not unlike the metal band that exists around a barrel. It has been shown to significantly reduce the incidence of fracture in the endodontically treated teeth.[6]

Crown to root ratio- The alveolar bone surrounding one tooth will naturally surround an adjacent tooth, and removing bone for a crown lengthening procedure will effectively damage the bony support of adjacent teeth to some inevitable extent, as well as unfavorably increase the crown to root ratio. Thus it would be prudent for patients to thoroughly discuss the treatment plan before undergoing an irreversible procedure like CCL.

With any surgical procedure there are contraindications. Crown lengthening is no exception. Medical or psychological factors contraindicating routine periodontal surgery would also apply in crown lengthening. In addition CCL would be contraindicated in teeth already weakened by extensive periodontal involvement. Projected exposure of furcation would cause one to look for other alternatives

An alternative treatment in this case would be orthodontic extrusion. The orthodontic procedure allows the movement of fracture line supragingivally and then optimizes the marginal sealing. This type of procedure usually takes 5-6 weeks for 2-3 mm of extrusion and retention period of 8-10 weeks. The major limitation is the longer duration of treatment and longer stabilization period.[7]

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considered an adjunct to conventional periodontal therapy, as well as an alternative treatment modality in cases with grade III furcation involvement. The biocompatibility of the material is evidence enough to warrant further research on the use of this biomaterial in periodontics.

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Conclusion

Crown fracture has been documented to account for upto 92% of all traumatic injuries to the permanent dentition. The number and extent of tissue involvement in the traumatic injury determine the management needs. Clinical crown lengthening in the anterior segment of the dentition requires a more elaborate and sophisticated diagnostic process, and treatment modality selection than CCL in posterior segment because the type of therapy chosen by clinician will have esthetic ramifications that are mostly irreversible. Hence it requires a complete understanding of wound healing and particular attention to detail so that a naturally occurring gingiva scaffold can be developed.

This case report illustrates that in traumatic injuries close to gingival third; the clinician should make a careful diagnosis and prepare for different treatment approach to maintain overall health of the tooth complex.

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