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CASE REPORT

INTERDISCIPLINARY APPROACH IN RESTORING FRACTURED LATERAL INCISOR

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ABSTRACT:
In present times, interdisciplinary form of treatment approach is getting popularity in the dental world. Adult orthodontics as a part of interdisciplinary treatment is actually an adjunctive orthodontic treatment. Adjunctive orthodontic treatment for adults is tooth movement carried out to facilitate other dental procedures necessary to control disease, restore function and/or enhance appearance.Thus interdisciplinary approach should be used to provide better esthetic result depending upon the need of the patient and functional stability for his/her improved quality of life. Here this case report presents, an interdisciplinary (Orthodontic, Endodontic and Prosthodontic) approach in adult female for the purpose of good esthetic result.

Key words: Interdisciplinary approach, fractured lateral incisor

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INTRODUCTION:

It is found that the number of adult patients seeking orthodontic treatment has increased considerably in the last decade. The orthodontic treatment of adult patients most frequently involves more than one discipline. Often orthodontic treatment is required for correcting malocclusions in patients requiring prosthetic replacement of fractured teeth, missing teeth or extracted teeth. Replacement of missing or extracted lateral incisors can be done with a tooth supported restorations like conventional full covered fixed partial dentures or cantilevered partial denture or resin bonded partial dentures or an implant supported crown. [1,2]

Implant supported crowns in the esthetic zone have a high success rate but the biological and technical failures are also frequent and the degree and onset of unaesthetic hard and soft tissue changes around the implant is also not predictable.[3] Fixed partial dentures may be successfully used in favorable situations, but debonding may be a common failure.[2] Long-term occlusal and periodontal studies have shown that canine substitution to the lateral incisor can produce a stable occlusal relationship with a modified group function relationship on the working side.[4]

Even though, canine substitution for maxillary lateral incisor is common in case of congenitally missing lateral incisors, therapeutic extraction of a tooth in the esthetic zone (maxillary lateral incisor) is rarely indicated in orthodontics. Maxillary lateral incisor extraction and space closure is considered only when the tooth is decayed beyond the scope of restoration. But for fractured tooth in esthetic zone first attempt should be made to preserve it and restore rather than extract it. If horizontal fracture of crown or root below gingival margin and apical fragment is sound enough to support a coronal restoration then coronal fragment is removed and root is treated endodontically. If tooth is endodontically treated then post and crown is better treatment option to preserve it.

For favorable prosthodontic coronal restoration of the remaining root, orthodontic extrusion of the root may be helpful. Subsequently, the root can be reconstructed with a coronal restoration. The prime objective of orthodontic extrusion is to provide both a sound tissue margin for ultimate restoration and to create a periodontal

environment (biologic width) that will be easy to maintain.[5] It is also mandatory to limit the eruption within the maximum limit of 4-5 mm[6] to avoid relapse and to maintain proper crown–root ratio for a favorable prosthetic restoration[7] and for long-term prognosis. Orthodontic extrusion can be achieved with various kinds of fixed or removable orthodontic appliances.[8]

CASE REPORT:

The case we present here is a 53-year-old female patient reported with chief complaint of fractured upper front tooth. Intraoral examination revealed an angles Class I malocclusion with crowding in the upper and lower arch. The upper right maxillary lateral incisor was fractured along the subgingival margin and it was previously endodontically treated. Post space preparation and temporary composite build up was done in the same. Composite build up was done for attachment of orthodontic appliance. An Ellis class II fracture was present in maxillary left central incisor [Figure 1]. The patient had an acceptable posterior occlusion, straight facial profile, normal nasolabial angle and a symmetrical face [Figure 2a, 2b, 3 and 4]. Sound periodontal support of upper right lateral incisor helped in treatment plan of restoration of tooth with post and crown. The treatment plan was to extrude the remaining tooth segment with orthodontic forces to provide sufficient tooth structure with proper dentogingival relationships and place single-crown restorations. It was judged that the planned extrusion would end up with a favorable crown - root ratio. The orthodontic treatment was initiated in upper arch with a fixed 0.22" slot pre-adjusted edgewise (MBT prescription) appliance. Treatment was initiated with 0.012" NiTi wire for leveling anterior teeth. [Figure 5] After 3 week, 0.016" x 0.016" NiTi was ligated for further correction for 3 weeks. Right upper lateral incisor was extruded in 40 days to planned position and after stabilized period of 21 days, fixed appliance was debonded. [Figure 6] Thus total treatment duration was 2 months including stabilization time to reduce the further delay for final crown. Then patient was referred to department of Conservative dentistry and Endodontics for needful restoration. Pre- fabricated metal post was inserted and composite core build up was done for the same, followed by PFM (porcelain fused to metal) crown. [Figure 7a, 7b and 8]

Figure 1: Intraoral front view

Figure 2a and 2b: Intraoral right and left view

Figure 3 and 4: Extraoral front and profile view

Figure 5: Orthodontic fixed appliance

Figure 6: Post orthodontic treatment

Figure 7a and 7b: Pre-fabricated post placement and core build up

Figure 8: Post treatment intraoral photo

DISCUSSION:

Loss of the coronal part of a permanent incisor in a patient can cause aesthetic and functional problems, which in turn can lead to severe emotional problems.[9] Extraction must not be the first treatment choice for fractured and extremely broken down, permanent teeth in the anterior region. Alternative treatment modalities must be considered. Orthodontic extrusion may be a suitable adjunct in providing for aesthetic and functional restorations.[10] Attachment to the root fragment for orthodontic extrusion might be difficult sometimes because of the lack of tooth tissue available for bonding and difficulties in isolating the bonding interface from gingival crevicular fluid and blood. For this reason temporary composite build up was made before orthodontic correction. In the present case, care was taken for extrusion, not exceed the maximum limit of 5 mm[6] to avoid relapse and to maintain proper crown–root ratio for a favorable prosthetic restoration.[7] Retention period to prevent relapse has also been suggested which varies from 1 week to about 1 month per millimeter of extrusion.[11] In present case, a period of stabilization of 21 days was given. Alternatively, an over-extrusion was also suggested[12], but this was not done because the relapse is unpredictable and could delay the further endodontic procedures.

Extrusion was done for an exposure of 2 mm supragingival tooth structure. This enables a circumferential core and crown ferrule of 1 mm each, which is mandatory for proper stress distribution and prevention of microleakage and failure of restoration. Care was taken for the crown–root ratio of at least 1:1 for a good long-term prognosis.[13] A cast post and core was preferred for good long-term prognosis[14] and improves the fracture resistance of endodontically treated tooth.[15]If the cooperation with the patient is well established, then this type of conservative interdisciplinary approach can be used instead of more invasive treatment of extraction and implant or fixed prosthesis, for better esthetics and stable functional occlusion.

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