INTRODUCTION

Nothing can be more concerning to a patient with dental trauma than the fracture of their teeth, as it leads to a loss of function and esthetics. Traumatic dental injuries can affect any age group, being more in children and adolescence.1,2 The increased incidence of trauma to the anterior teeth usually results from falls or accidents, and the crown fractures are the most common one. Therefore, a systematic approach should be followed for a successful outcome during the management of such cases. In the present case, we report a conservative and noninvasive interdisciplinary rehabilitation of form, function, and esthetics of the traumatized maxillary incisors.

CASE REPORT

A 20-year-old male patient reported to the Conservative and Endodontics department of King George’s Medical University, Lucknow, India. His chief complaint was fractured front teeth, difficulty in chewing food, and esthetic disfigurement. He wanted immediate, noninvasive rehabilitation of his teeth. The patient gave a history of trauma due to accidental fall from the motorcycle 30 days back. However, the patient did not give any relevant history of swelling or bleeding from the soft tissues associated with the fractured teeth. The patient’s medical history was insignificant. Extraoral examination showed insignificant findings. Intraoral examination revealed maxillary right central incisor (11) and maxillary left lateral incisor (22) with Ellis and Davey Class III fracture at the cervical one-third involving the enamel, dentin, and pulp; however, maxillary left central incisor (21) was extrusively luxated due to which the teeth were out of occlusion [Figure 1]. There was an open bite throughout the patient’s mouth. Pulp sensitivity test revealed negative findings. Mobility in relation to 21 showed Grade 1 mobility, and no mobility was present with respect to 11 and 22. Radiographic examination revealed completed root end development in all the respective involved teeth with no associated root fracture and periapical lesion. Irreversible hydrocolloid alginate impression was taken.
and preoperative diagnostic casts were made. After thorough evaluation of clinical examination, radiograph, and mounted diagnostic casts, a systematic treatment plan was laid down which consisted of reduction of incisal edge of extruded left central incisor first (21), endodontic treatment of all the involved teeth (11, 21, and 22) followed by glass fiber post, composite core buildup, and all-ceramic crowns. The treatment plan was explained with all the risks and benefits to the patient. The patient agreed to this treatment option, and consent was taken.

On the following appointment, local anesthesia was given, and teeth were isolated with rubber dam. The first incisal edge of the left maxillary central incisor was reduced (21) as it was interfering with the occlusion. After that, root canal instrumentation was done in all the involved teeth (11, 21, and 22) followed by obturation by lateral condensation method [Figure 2]. Laser was then used to ablate the gingiva to expose sufficient coronal tooth structure and to have a clear margin for the crown placement [Figure 3]. Thereafter, the canals were prepared for fiber post placement, and gutta-percha was removed using Peeso reamers till two-third of the root length, leaving the 4–5 mm of apical gutta-percha to maintain a good apical seal. Fit of the post was confirmed radiographically. After preparing postspace, canal preparation was done for the post placement. The first etching of the root canal was done with 37% phosphoric acid gel for 20 s followed by copious rinsing with water and then, air dried gently; however, care should be taken not to over dry it to avoid any desiccation and collagen collapse. Next, the glass fiber-reinforced composite post was placed into the canals up to the measured space, using dual-cure resin cement (RelyX™ Ultimate), after which it was cured by light [Figure 4]. Core was then formed with composite resin for 11 and 22 using incremental technique along with occlusal adjustment. A postoperative intraoral periapical radiograph was taken to confirm the placement of the post up to the desired length [Figure 4]. Then, tooth preparation was done in relation to the concerned teeth [Figure 5]. Gingiva was retracted adequately, and impressions were made using silicon putty impression material (Aquasil,
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Dentsply). Complete coverage all-ceramic crowns were fabricated, and tried on core for marginal fit and occlusion. The final cementation was carried out using dual-cure resin cement [Figures 6 and 7].

**DISCUSSION**

The present case report describes a conservative and noninvasive approach for achieving functional and esthetic rehabilitation of the fractured teeth. The prognosis of these fractured teeth will be doubtful if they are not supported by post and core foundations. In this case report, laser was used to ablate the gingiva to expose sufficient coronal tooth structure and to have a clear margin. Laser provided the bloodless and painless cutting of the gingiva and also allowed the placement of post and core fabrication with composite on the same day. Caution was taken not to encroach the biological width and to prevent any periodontal complication further. The primary purpose of post is to retain the core in a tooth with extensive loss of coronal tooth structure and hence to resist lateral and shearing forces, especially in the anterior region.[3]

Owing to high modulus of elasticity of cast post, force is transmitted to the less-rigid root dentin and concentrates at the apex of the post, leading to increased chances of root fracture.[4,5] However, glass fiber posts were placed to retain the composite core as it allows more uniform distribution of stresses in the root, which results in fewer catastrophic failures as compared to metal posts. Moreover, glass fiber posts are more esthetic and do not cause any discoloration and shadowing on the gingival and cervical areas of the tooth. Hence, the decision regarding the treatment plan and postinsertion should be based on the position of tooth in the arch, amount of remaining tooth structure, and esthetic requirements.[6-8]

To fulfill the patient’s esthetic expectations, we decided to place all-ceramic crowns to mimic the lustrous, life-like appearance of the natural teeth.

Thus, we can say that with materials available today, one can restore such structurally compromised fracture teeth noninvasively, especially where emergency and immediate care is required. Therefore, an interdisciplinary systematic approach can restore functions and pleasing esthetics of the traumatized teeth.

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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Leroy RL, Aps JK, Raes FM, Martens LC, De Boever JA. A multidisciplinary treatment approach to a complicated maxillary dental trauma: A case report. Endod Dent Traumatol 2000;16:138-42.
2. O’Neil DW, Clark MV, Lowe JW, Harrington MS. Oral trauma in children: A hospital survey. Oral Surg Oral Med Oral Pathol 1989;68:691-6.
3. Dietschi D, Romelli M, Goretti A. Adaptation of adhesive posts and cores to dentin after fatigue testing. Int J Prosthodont 1997;10:498-507.
4. Cormier CJ, Burns DR, Moon P. In vitro comparison of the fracture resistance and failure mode of fiber, ceramic, and conventional post systems at various stages of restoration. J Prosthodont 2001;10:26-36.
5. Mannocci F, Ferrari M, Watson TF. Intermittent loading of teeth restored using quartz fiber, carbon-quartz fiber, and zirconium dioxide ceramic root canal posts. J Adhes Dent 1999;1:153-8.
6. Heydecke G, Butz F, Hussein A, Strub JR. Fracture strength after dynamic loading of endodontically treated teeth restored with different post-and-core systems. J Prosthet Dent 2002;87:438-45.
7. Kimmel SS. Restoration of endodontically treated tooth containing wide or flared canal. N Y State Dent J 2000;66:36-40.
8. Rosentritt M, Furer C, Behr M, Lang R, Handel G. Comparison of in vitro fracture strength of metallic and tooth-coloured posts and cores. J Oral Rehabil 2000;27:595-601.