Images in Medicine

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Dentistry Section

Salvaging the Mutilated Internally Resorbed and Perforated Maxillary Incisor-One Year Six Months Follow-Up

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A 28-year-old male patient reported with the chief complaint of hollowing and discoloration of upper front teeth. The teeth were traumatized 10-12 years back [Table/Fig-1a]. Patient had undergone root canal treatment of 21 seven years back. Root canal of 12 was accessed elsewhere two days before the patient reported to the Department of Conservative Dentistry and Endodontics at Hitkarini Dental College and Hospital, Jabalpur, India.

On intraoral examination, there was a draining sinus, in relation to carious 11. Periodontal examination revealed a clinical probing depth of 5 mm in relation to 11, measured with Naber's probe. Intraoral periapical radiograph revealed internal resorption in 11, iatrogenic lateral perforation with 12, incomplete obturation of 21[Table/Fig-1a].

Endodontic treatment of 11, 12 and re-treatment of 21 followed by flap debridement along with placement of MTA and PRF at the perforation site was planned.

First phase included

Tooth 11: After complete removal of infected dentin and irrigation with sodium hypochlorite. Working length was radiographically determined. Intracanal calcium hydroxide paste was placed and access cavity was sealed with Cavit temporary filling material. On recall examination next week, the sinus opening disappeared. The calcium hydroxide was flushed out and canal was irrigated with normal saline. After drying the canal with paper points, sectional obturation was performed using 60 (2%) master cone by vertical compaction with appropriate sized hand plugger, using AH-Plus sealer. After sectional obturation a fiber post was cemented with a core buildup material [Table/Fig-1b].

[Table/Fig-1a,b]: (a) Pre-operative picture showing hollowed and discoloured 11 and discoloured 21 and pre-operative IOPA radiograph revealed Internal resorption in 11, iatrogenic lateral perforation in 12, incomplete obturation in 21.
(b) Fiber post (FRC Postec Plus size 3) cementation with a core buildup material (Comp Core AF), IOPA radiograph shows sectional obturation with GP cone and cemented fiber post with 11, obturated 12 and 21 with gutta percha by lateral compaction.

Tooth 12: Pulp was extirpated after modification of access cavity. The canal was cleaned and shaped. Tooth was obturated with gutta percha using lateral compaction method [Table/Fig-1b].

Tooth 21: Complete removal of gutta purcha was done using rotary re-treatment files and H file. After cleaning and shaping, ortho grade obturation was done with 70 (2%) master cone with lateral compaction [Table/Fig-1b].

Patient was recalled for 2nd phase of treatment.

Full thickness mucoperiosteal flap was reflected extending from middle of the canine region of 1st quadrant to distal of lateral incisor of 2nd quadrant. The perforation site was exposed [Table/Fig-2a, 2b].

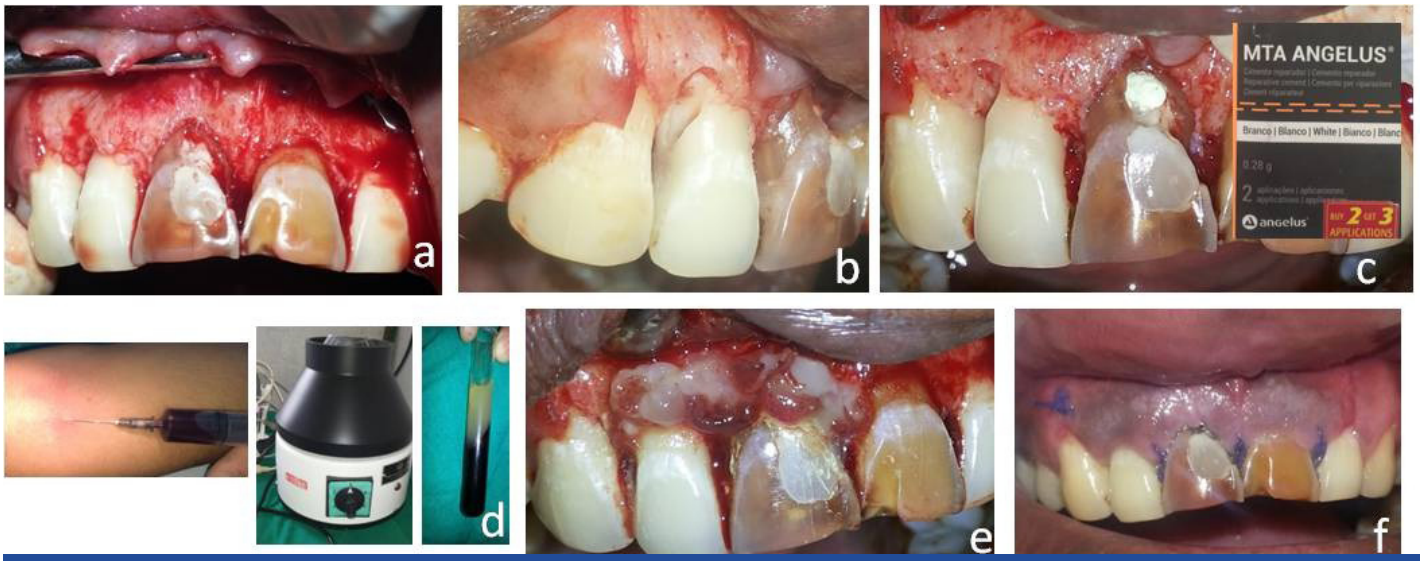
All the granulation tissue was curetted. The surgical field was cleaned, dried and MTA was placed at the site of perforation [Table/Fig-2c]. Intravenous blood was collected and PRF was prepared in a centrifugation machine [Table/Fig-2d]. After which PRF was placed on the surgical field [Table/Fig-2e]. The mucoperiosteal flap was repositioned and simple interrupted sutures were given using absorbable vicryl suture.

Post-operative care was explained to the patient, with instructions to report back after a week for checkup [Table/Fig-2f]. After one month, fixed crowns were placed. Follow-up recall demonstrated satisfactory healing [Table/Fig-3b-3e,3g,3h]. Periodontal examination revealed reduction in clinical probing depth of 5 mm to 3 mm in relation to 11, measured with Naber's probe.

DISCUSSION

Internal resorption has been defined "as a pathologic process initiated within the pulp space with loss of dentin". It is often diagnosed accidentally as the process is asymptomatic until perforation occurs. The etiology of internal resorption is not fully understood. However trauma and chronic pulpitis are considered as risk factors. Root perforation may be caused by caries, resorptive processes and can also be induced iatrogenically [1]. Mineral Trioxide Aggregate (MTA) is widely accepted as the preferred repair material for root perforations and has many favorable properties, including (1) good sealing ability (2) biocompatibility (3) radiopacity and moisture resistance [2].

When a tooth requires endodontic treatment, consideration must be given to the restorability of the tooth. Reinforcement of a compromised tooth to fracture strength equal to or greater than its original "untreated" fracture resistance is done by fibre post. There is also a need for adherence to the core material and the coronal dentin [3].



[Table/Fig-2a,f]: (a),(b) Mucoperiosteal flap raised and perforation site exposed.
(c) The surgical field cleaned, dried and MTA placed,
(d) PRF prepared by collecting intravenous blood by venipuncturing the antecubital vein in a 10ml sterile tube without anticoagulant and centrifuged at 3,000 rpm for 10 minutes. Formation of structured fibrin clot in the middle of the tube, just between the red corpuscles at the bottom and acellular plasma (platelet-poor plasma) at the top.
(e) PRF separated from red corpuscles base (preserving a small RBC layer) using sterile tweezers and placed on the surgical site.
(f) One week after surgery there was satisfactory healing.

[Table/Fig-3a,f]: Preoperative IOPA radiograph and picture, recall IOPA radiograph and picture b) one month, c) six months, d), g)one year demonstrating 3mm probing depth, e), h)one year six months.

Healing is promoted by the local application of growth factors and host modulating agents to maximize the body's healing potential. PRF by Choukroun's technique is produced without using an anticoagulant, bovine thrombin, or calcium chloride for platelet activation and fibrin polymerization [4]. Perforations can be repaired successfully with MTA as well as, it is important to consider the periodontal and restorative prognosis of the tooth.

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