

## CASE REPORT

# MANAGEMENT OF AN ACCIDENTALLY COMPLETELY EXARTICULATED 11 DURING SURGICAL REPOSITIONING OF TRAUMATICALLY INTRUDED TEETH 11 & 12 – A CASE REPORT

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### Abstract

The aim of this report is to present the case of an accidentally avulsed 11 during surgical repositioning of traumatically intruded 11 and 21 kept in saline solution from the moment of avulsion until its reimplantation 45mins later. Avulsion of permanent teeth is one of the serious dental injuries, and a prompt and correct emergency management is very important for the prognosis. The avulsed tooth was replanted back into the alveolar socket and splinted, endodontic treatment was done followed by post obturation restoration. Radiographic and clinical examinations at 10 months follow up revealed satisfactory healing. Amount of damage to the tooth, storage medium, extra oral time, promptness of rendering emergency treatment, etc all play a role in the prognosis of the avulsed tooth.

**Key Words:** Avulsion, reimplantation, surgical repositioning, storage media

## INTRODUCTION

Surgical repositioning is one of the treatment modalities for traumatically intruded teeth. However, inadvertent exarticulation during repositioning procedure is a disadvantage leading to higher risk of ankylosis and damage to periodontal ligament<sup>1</sup>.

“Avulsion” or “complete extarticulation” is used to describe a situation in which a tooth has been removed from its socket as result of severe trauma. Avulsion of permanent teeth is seen in 0.5–3% of all dental injuries. Prognosis of avulsion is very much dependent on the actions taken at the place of accident and promptly after the avulsion. Reimplantation is in most situations the treatment of choice, but cannot always be carried out immediately. An appropriate emergency management and treatment plan are important for good prognosis<sup>2</sup>.

## CASE REPORT

A 35 year old female reported with avulsed 11 and improperly repositioned 21 (fig- 1 & 2) in the Dept. of Conservative Dentistry and Endodontics at Dr. R. Ahmed Dental College and Hospital, Kolkata. Patient revealed a

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history of trauma 2 weeks back resulting in intrusion of 11, 21 & slight extrusion of 22 (fig-3) and in an attempt of surgical repositioning in one of the departments of our college, 11 was accidentally completely exarticulated and 21 was improperly repositioned (fig-1 & 2). 11 was brought in 0.9% NS [normal saline] (fig-4) within 30 mins of exarticulation. On examination of avulsed tooth, the crown was intact and the root had a closed Apex.

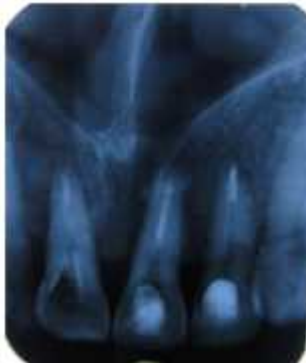
The patient was immediately anaesthetized; the alveolar socket was washed with normal saline solution to remove the blood clot and examined to rule out any fracture in the socket wall. After examination, 11 was slowly reimplanted with slight digital pressure (fig 5 & 6) within 45mins of exarticulation. The improperly positioned 21 was surgically repositioned with anterior forcep ( fig 7 ), followed by fibre splint stabilization of 11 and 21 ( fig 8).

Normal position of the reimplanted tooth was verified radiographically (fig 9). Normal overjet and over bite was obtained. Slight extrusion of 22 was

managed by aesthetic grinding. Patient was advised to avoid biting on the splinted teeth and maintain her oral hygiene. RCT was started within 7 days of splinting i.e. 20 days after trauma (fig-10) and long term calcium hydroxide dressing was given (fig-11). Splint removal was done after 4 weeks (fig – 12). Tooth were firm showing normal physiological mobility and normal arch form was obtained (fig-13). Patient was advised to maintain her oral hygiene and to resume normal function as soon as possible.

However, Periapical radiograph after 3 months showed slight periapical resorptive changes with respect to 11,21 ( fig- 14).

Placement of PRF (Platlet Rich Fibrin) periapically was planned so as to promote collagen synthesis, PDL regeneration. After explaining the procedure to the patient & taking informed consent, 5ml of venous blood was withdrawn under all aseptic measures. The blood was immediately centrifuged to obtain PRF ( fig – 15 ). Multiple small pieces of PRF were done with the help of sterile scissors ( fig- 16 ) and was condensed gradually using the controlled



pressure with the help of pre-adjusted plugger ( fig - 17) to carry it into the apical region of 11,21.

After orthograde placement of PRF periapically, MTA was plugged in apical 4-5 mm of canal to prevent inflammatory root resorption and promote healing by regeneration (fig – 18 ). Remaining root canal was obturated with gutta percha and AH plus sealer followed by post obturation restoration ( fig – 19).

10 months followup showed arrest of resorptive changes and satisfactory periapical healing (fig – 20).

## DISCUSSION

In the presented case, 11 was accidentally completely exarticulated during surgical

repositioning of intruded teeth 11 and 21. Extra oral time before reimplantation of 11 was 45 mins. This further increased the risk of ankylosis and inflammatory root resorption and leaves a questionable prognosis<sup>1</sup>.

Treatment in this case was aimed to prevent the tooth loss, maintain aesthetic and functional properties and minimize inflammatory root resorption when performing the treatment.

Management of avulsion of the permanent dentition often presents a challenge. The outcome and success rate of the reimplantation depend on many factors<sup>3,4,5,6</sup>

- status of avulsed tooth,
- storage environment,
- dryness in extra-alveolar period,

- the treatment time and modality,
- Concomitant dentoalveolar injuries.

**Status of avulsed tooth-** In the present case , the avulsed tooth was intact and had a closed apex.

**Storage medium** is crucial factor for successful reimplantation and many storage media have been recommended (Hank's Balanced Salt Solution [HBSS], ViaSpan, Eagle's Medium, milk, sterile saline, etc.)<sup>7</sup>.

**Storing the tooth** in a physiological medium (0.9% NS) until reimplantation for a short period (4hrs) is well accepted<sup>8,9</sup>.

**Extraoral time** is another crucial factor determining prognosis<sup>2</sup>.

1. When the tooth has been replanted immediately or after a very short time at the place of accident, the PDL cells are most likely viable.
2. When the tooth has been kept in storage medium (e.g., tissue culture medium, HBSS, saline, milk, or saliva and the total dry time has been <60 min), the PDL cells may be viable but compromised
3. When the total extra-oral dry time has been more than 60 min regardless of if the tooth was stored in an additional medium or not, the PDL cells are non-viable

In the presented case, as the avulsed tooth was reimplanted within 45 mins and stored in 0.9% NS, the PDL cells may be viable but compromised.

### Treatment time and modalities

RCT was started within 7 days of splinting i.e. 20 days after trauma. When root canal treatment is initiated later than 10 days after the accident, or if active external inflammatory resorption is observed, the preferred antibacterial protocol consists of long-term dressing with densely packed calcium hydroxide. Calcium hydroxide creates an alkaline pH in the surrounding dentinal tubules, kill bacteria, and neutralize endotoxin, a potent inflammatory stimulator<sup>10</sup>.

Hence in this case long term calcium hydroxide dressing of 3 months was given.

Current guidelines of IADT (International Association of Dental Traumatology) supports short-term (2 weeks), flexible splints for splinting of replanted teeth. Studies have shown that periodontal and pulpal healing is promoted if the replanted tooth is given a chance for slight motion and the splinting time is not too long. However, in this case splinting of teeth was done after 4 weeks as exarticulation was a consequence of management of traumatic intrusion. As per the guide lines of IADT, once an

intruded tooth has been repositioned surgically or orthodontically, stabilization with a flexible splint for 4–8 weeks should be done<sup>2</sup>.

Hence in this case, splint removal was done after 4weeks.

PRF was plugged periapically to stop resorptive changes and promote collagen synthesis, PDL regeneration<sup>11,12,13,14</sup>. Apical 4-5 mm of MTA prevent inflammatory root resorption and promote healing by regeneration<sup>15,16</sup>.

On 10 months followup after obturation, satisfactory periapical healing was observed on radiograph.

## CONCLUSION

The avulsed tooth can maintain aesthetic and functional properties for some years after the reimplantation. In this case, the replanted tooth remained in a stable functional position during the 10 months of follow up. However longer follow up is required in such cases.

Reporting the success of this case of surgical repositioning including complete exarticulation following traumatic intrusion draws special attention.

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