





physiological wound healing. There was no history of trauma or orthodontic treatment, and no injurious habit was reported by the patient.

Intraoral examination revealed fair oral hygiene, intrinsic stains, generalised bleeding on probing, generalized moderate attachment loss, missing mandibular incisors &



supraeruption of tooth #11, 12 & 21 (Fig 1). Pocket depth in tooth #11 was - mesiobuccal - 5 mm / distobuccal - 5 mm, in tooth #12- mesiobuccal - 5mm / distobuccal - 5mm, in tooth #21- mesiobuccal - 5mm / distobuccal - 5mm. Also, class II mobility irt 11, 12, 21 was present. Her pain and discomfort was originating from this area. Radiographically there was a wide radiolucency & PDL



widening around teeth 11, 12, 21 (Fig 2).

Vitality test revealed that the teeth were non-vital. A partial denture or an implant placement after the extraction of all the 3 teeth was suggested. However, she rejected and demanded to retain the natural teeth by any means. Considering the clinical situation, intentional replantation of tooth 11, 12, 21 was planned after explaining the pros and cons of treatment to the patient. She wanted to try the treatment with an understanding that the tooth still might not survive.

We decided to carry out the root canal treatment for all 3 teeth but planned replantation only for the tooth 11, 12 & leave out the tooth 21 with an intention to compare the radiographic changes between the treated & untreated site after 1 year, and then proceed for the replantation of other side.

**Treatment Procedure**

Oral prophylaxis was carried out, 1 week after that root planing & curettage was performed by pressing the tooth inwards. Intentional root canal treatment was carried out intra-orally irt 11, 12 & 21. Replantation procedure was scheduled 4 weeks after the completion of root canal treatment (Fig 3 & 4).

During the replantation procedure, atraumatic extraction was done i.r.t the tooth 11 and 12 after achieving adequate local anaesthesia. After extraction, teeth were placed

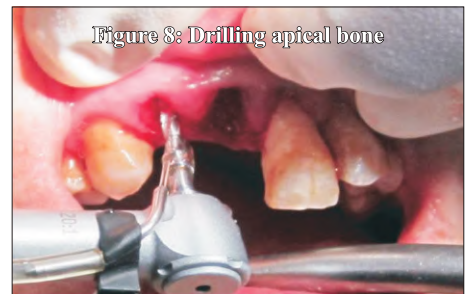


in the saline solution. The granulation tissue at the bottom of the socket was removed by gently curetting the area and rinsed with sterile saline solution. The epithelial lining of the pocket was gently scraped with gracey curettes to remove inflammatory tissues & blood clots. The extracted teeth were carefully root planed for removal of necrotic cementum, calculus and granulation tissue by holding the apical portion with a sterilized moistened sponge to keep the periodontal ligament cells viable, which were anticipated to be present on the



apex of the teeth (Fig 5, 6 & 7).

Extruded teeth were then placed back apically into the socket at new position with their roots contacting directly to the alveolar bone after drilling apical bone with 4 mm implant drill corresponding to the anatomic root dimensions. Teeth were then stabilized by wire & composite splinting on the labial surface with stainless steel wire and



composite, to the adjacent teeth for 6 months (Fig 8, 9, 10 & 11).

The time interval between extraction and subsequent replantation of teeth did not exceed 5 mins due to the team effort. Patient was prescribed Doxycycline 200 mg loading dose followed by 100 mg once a day for one week and post operative instructions were given to maintain proper oral hygiene. Patient was recommended to use interdental brush at the replantation site, in addition to the routine oral



**Gupta, et al.:Intentional Replantation along with Apical Repositioning of Periodontally Involved Hopeless Adjacent Maxillary Incisors:A Procedure as a Last Resort**

hygiene attempts & chlorhexidine mouthwash 0.2% was prescribed twice daily for 14 days. She was instructed to avoid biting from the treated site for 3 months. She was first examined after 1 week & was placed on a monthly maintenance recall program.

The teeth were relatively firm and asymptomatic after first 3 months. There was no bleeding on probing & the pocket depths at the end of 3 months were on the Tooth #11- mesiobuccal -5 mm/ distobuccal - 4 mm, on Tooth #12- mesiobuccal - 4mm/ distobuccal - 4mm.

She was able to use the teeth in a normal manner although she paid a special attention not to chew hard food by anterior teeth. It was determined that the replanted teeth had class I mobility.

At the 6th month the radiolucent area diminished remarkably irt 11 & 12 as compared to 21, where area of radiolucency & pdl widening was still there. No sign of resorption and ankylosis was present. Teeth

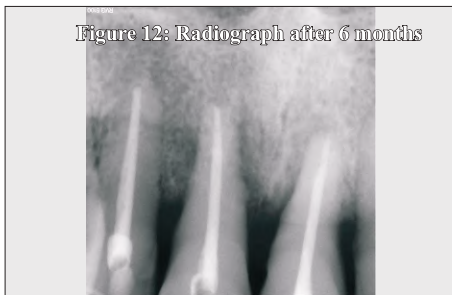


Figure 12: Radiograph after 6 months

were firm and asymptomatic. Class I mobility was still present but the splinting was removed to enhance the esthetics. (Fig 12)

The pocket depths were on the Tooth #11- mesiobuccal - 4 mm/ distobuccal - 3 mm, Tooth #12- mesiobuccal -3mm/ distobuccal - 3mm. Periodontal health was in normal limits with no bleeding on probing. The gingiva around the teeth was pink, firm & in good shape. We have to emphasize that the patient's oral hygiene was excellent; there was no plaque or calculus at all. A regular periodontal maintenance therapy was performed that consisted of scaling and polishing & patient is recalled after 3 months.

Presently, after 8 months patient is using the tooth effectively and is under the periodic maintenance program.

### Discussion

The preservation of natural dentition is the primary goal of any conservative treatment modality. Intentional replantation is an accepted endodontic procedure for cases in which intracanal and surgical endodontic treatments are not recommended.<sup>[17]</sup>

The success of this treatment primarily depend upon the maintenance of aseptic conditions during the intervention, atraumatic extraction, minimal manipulation of the periodontal ligament, short extra-oral time, minimizing occlusal forces following replantation, as well as carefully controlled postoperative patient compliance.<sup>[9]</sup>

Medically compromised patients, presence of periodontal disease in which there

is marked tooth mobility, furcation involvement or gingival inflammation are thought to be a contraindication. However, some reports suggested that it can be a successful treatment alternative for periodontally involved hopeless teeth as a last resort at least for some period of time.<sup>[7][8]</sup>

Kaufman reported successful results of a maxillary molar tooth after 4 years follow-up period, which was treated with intentional replantation.<sup>[18]</sup> A mandibular first molar, which was replanted, by Czonstkowsky and Wallace had no signs of resorption and ankylosis after 6 months.<sup>[19]</sup> Different investigators reported success rates varying from 52% to 95% with follow-ups between 1 to 22 years in posterior teeth.<sup>[3][20-22]</sup>

Bender and Rossmann reported a success rate of 77.8 % in the molar teeth. Raghoobar and Vissink replanted 29 teeth consisting of 2 mandibular first, 17 mandibular second, one mandibular third and 9 maxillar second molars and evaluated for an average of 62 months. The success rate was 72 % and 25 of them were still in function.<sup>[23]</sup>

Demiralp and others evaluated the clinical and radiographic results of intentional replantation of periodontally involved teeth after conditioning root surfaces with tetracycline-HCl.<sup>[8]</sup> Thirteen patients with 15 periodontally involved “hopeless” teeth were included in this study. During the replantation procedure, the affected teeth were gently extracted and granulation tissues, calculus, remaining periodontal ligament and necrotic cementum on the root surfaces were removed. Tetracycline-HCl, at a concentration of 100 mg/mL, was applied to the root surfaces for 5 minutes. The teeth were then replaced in their sockets and splinted. After 6 months, no root resorption or ankylosis was observed radiographically. Although the period of evaluation was short, the authors suggest that intentional replantation can be an alternative approach to extraction in cases where advanced periodontal destruction is present and no other treatment can be considered.

The success rate of intentional replantation varies according to the observation period and the success criteria. It is difficult to compare our case with other investigators since our treatment site, treatment technique, and most importantly the periodontal health of the replanted tooth was completely different from the other authors. Most importantly, replantation of 2 adjacent anterior teeth simultaneously with apical repositioning is not very common.

In our case, teeth had class II mobility, deep periodontal pockets and bony defect around the roots of 3 adjacent teeth. This tooth had no chance of treatment with conventional forms of treatment and therefore a poor to hopeless prognosis.

External root resorption is a serious complication of replantation (usually small areas of root resorption may not be detected on the radiographs). Since the slight external root resorption may not be detectable radiographically, the periodontal health of the tooth is more important and reliable parameter for the prognosis.<sup>[22][24]</sup> Teeth with a necrotic periodontal ligament showed a high incidence

of resorption and ankylosis. Denuding the root surface chemically prior to replantation of the teeth was suggested in order to prevent resorption.<sup>[25]</sup> Due to these reasons, viable periodontal ligament cells were protected at the apical portion of teeth prior to replantation in our case.

According to Kratchman, successful completion of extra-oral manipulation should not exceed 10 minutes to preserve the viability of periodontal ligament cells, if present. In our case, extra-oral time taken in the treatment was only 5 minutes.

Araujo and others demonstrated that processes including root resorption, ankylosis and new attachment formation characterized healing of a replanted tooth that had been extracted and deprived of vital cementoblasts.<sup>[17]</sup>

At the end of 6 months, radiographically no resorption or ankylosis was seen in our case. If the standard protocols during intentional replantation are not followed, root resorption and ankylosis may be observed within 1–2 months.<sup>[8]</sup> This could be due to either the effective elimination of necrotic periodontal membrane and/or microorganisms prior to replantation. Further, tetracycline-HCl treated root surfaces might have acted as a slow release reservoir for its antibacterial effect and reduce the deleterious effect of inflammatory responses. In addition to antibacterial effect, tetracycline-HCl might have reduced osteoclastic bone resorption and collagenase activity by its well-known properties.<sup>[26][27][28][29][30]</sup>

In our case, the procedure did not seem to cause any damage to the underlying structures, probably because a good apical and coronal seal was obtained, resulting in a healthy periapical –periodontal environment.<sup>[14][15]</sup>

### Conclusion

This case is a reminder of the fact that any treatment method has its own advantages and disadvantages that can affect the prognosis of the tooth & need not negatively influence periodontal healing.

With the high success rate of dental implants and endodontic treatment, intentional replantation is not frequently the treatment of choice. Although the success rate is not always high, intentional replantation may be a treatment alternative that deserves consideration to maintain the natural dentition and avoid extraction of the tooth.

The case needs to be further evaluated clinically and radiographically to assess the healing and mobility of the tooth in the long term.

### References

References are available on request at [editor@healtalkht.com](mailto:editor@healtalkht.com)

