

# REVIEW ARTICLE

## REIMPLANTATION OF AVULSED TOOTH: A REVIEW

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### ABSTRACT:

Dental avulsion is the most severe type of traumatic tooth injuries as it hammers many associated structures and results in the complete displacement of the tooth from its socket. The most common complications after avulsions are necrosis of the pulp and root resorption. Treatment of avulsed tooth is often complex, time consuming, and expensive and requires multidisciplinary approaches such as endodontic and periodontal treatments, surgery, orthodontic movements, as well as esthetic coronal restoration. This review describes new clinical modalities for the treatment of avulsed teeth that can preserve the vitality of the periodontal ligament cells that remain on the root surface which is the key to success of replantation.

**Keywords:** Avulsed tooth; Reimplantation; Surgery

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## INTRODUCTION

Avulsion or exarticulation is a state that the teeth apart from its alveolar socket because of a traumatic injury.<sup>1,2</sup> Young anterior permanent tooth loss can lead to cessation of the alveolar bone formation, the alveolar bone on the alveolar ridge becomes narrow and difficult to be restored in the future using either a bridge or implant restoration.<sup>3,4</sup>

Reimplantation is one of management option for young permanent anterior avulsed teeth. The best time to do reimplant is immediately the tooth avulsed. It is associated with a good prognosis because the chances of healing pulp tissue and periodontium ligament.<sup>2,5-6</sup> If reimplant could not be performed immediately, the teeth are stored in a medium that has an osmolality and pH in order to maintain the vitality of membrane periodontium and avoid drying of teeth.<sup>3,7-8</sup> Some of the storage media are Hank's Balance Salt solution (HBSS), a solution of a modified Eagle, Via Span, Euro-Collins, Emergency Medical Tooth Saver, saline, powdered milk or pasteurized milk, cow's milk, saliva, or chicken eggs.<sup>1,9-10</sup>

If the avulsed tooth have an extra-oral dry time of more than 60 minutes, it was preferably soaked in an acid solution for 5 minutes to remove the remaining periodontiumligament and then the teeth soaked in stannous fluoride 2% for 5 minutes or the root can be coated with emdogain.<sup>1,11</sup>

The teeth resistance to resorption due to expected to have slightly vitality of the of periodontal cells.<sup>8,11</sup> Endodontic treatment can be done extra oral for not longer than 60 minutes, to discard of necrotic pulp tissue, cleaned and obturated.<sup>2,12</sup> The endodontic procedures shouldbe stay with the trias endodontic rules and ensure the root canal free of bacteria.

According to the American Association of Endodontic, dental splint is a rigid or flexible tool or material used to support, protect, or immobilize tooth after reimplantation, fracture or exposed certain endodontic surgical procedures.<sup>9</sup> Splinting is one of the important things in the treatment of avulsed teeth.<sup>13</sup> The aim is to stabilize and immobilize the teeth for the time needed to ensure there are no additional injury and to protect the attachment apparatus to assist periodontal fibers to regenerate.<sup>11-12</sup> The risk of developing gingivitis exist and generally are reversible and disappear after the splint is removed. Do not have to stick to the wire tightly to enamel because composites will fill the gap between the teeth and the wire. Wire-Composite Splint should elongated two or three teeth laterally from the avulsed teeth.<sup>11,12</sup>

Once the splint is in place, radiographs should be taken to ensure the avulsed teeth position is correct and as a reference pre-operative treatment for further control.<sup>10</sup> The recommendation of duration splinting in avulsed teethis not more than 7-10 days to prevent ankylosis. Splint is causing

quite a lot of damage to dental injuries and the risk of bacterial invasion into the wound periodontal splint and wires due to proximity to the edge of the gingiva.<sup>8</sup> Periodically check-up recommendation performed once a week in first month postreimplantation and splinting then in the 3rd, 6th and 12th month, and once a year for at least 5 years parallelly to level of healing.<sup>1,10</sup>

Examination of the clinical and interpretation of radiographic done to provide information on the conditions on the tooth avulsion and periodontal membrane.<sup>14</sup>

Although there is the risk of ankylosis, in pediatric patients and adolescents reimplant should still be done and considered as a temporary settlement.<sup>1</sup> Wire-composite splint give advantage to maintain the teeth post reimplantation and the vertical as well as horizontal dimensions of the alveolar bone until the stabilization and immobilization has been completed

Reimplant in this case become the treatment of choice in spite of 10 days of avulsion by considering the age and the stages of growth and development of the patient. Based on the literature, teeth implants are the treatment of choice for esthetic and mastication returns immediately.<sup>15</sup> Some previous studies have said that reimplant in pediatric and adolescents dentistry patients is temporary care, but reimplant can maintain vertical dimension of face and horizontal alveolar bone until bone growth is complete

Pathophysiology lies in the fact that extrusive forces impinging on the teeth, when severe enough, can cause a tooth to be displaced out of its socket. For this to happen, the periodontal ligament would have ruptured with remnants remaining on the cementum of the root of the tooth and the inner walls of the alveolar socket. The vessels entering the pulp through the apical foramen would also have been severed with cessation of blood supply to the pulp. The extent of injury sustained by the periodontal ligament and the pulp, and the subsequent healing of these tissues will depend on the extra-alveolar period i.e. the time remains out of its socket and the handling of the tooth.<sup>16</sup> Treatment is directed at avoiding or minimizing the resultant inflammation from the two main consequences of the avulsed tooth-namely, attachment damage and pulpal infection. The best outcome for a tooth avulsion is when the tooth can be replanted. within a few minutes after the accident. A very high percentage of teeth replanted within 15 minutes will have the PDL restored within a few weeks.<sup>17</sup> Clinical and radiographic follow-up of avulsed teeth is essential to define prognosis and should be kept for longer periods between 5 and 10 years

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