

Embedding Avulsed Permanent Tooth in Patient's Connective Tissues Insures Better Possible Prognosis in Replantation; A Hypothesis

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Abstract

This hypothesis declares that avulsed permanent tooth can be preserved live inside patient's body flesh for afterwards replantation. Such type of live preservation would be applicable for patients who get avulsed teeth by complete displacement of a tooth from its socket in alveolar bone owing to trauma and in which teeth cannot be immediately replanted due to maxillofacial surgical complications. In such circumstances, the surgeon can embed the detached fresh healthy teeth somewhere in non-oral patient flesh; e.g. in subcutaneous superficial connective tissues of under armpit or lateral abdominal regions. The embedded teeth would not perish in patients flesh since they would receive nourishment through diffusion from their surrounding connective tissue. In later proper stages, OMS surgeon will remove the embedded teeth and replants them in their original sockets. Such treatment reduces chance of loss of permanent teeth due to dental avulsion in patients having accidents which go through problematic and complicated OMS treatments.

Key words: Dental avulsion, Teeth replantation, Dental implant, Teeth replacement

1. Background

Statistics show that there are five million teeth knocked-out each year in the United States [4]. Approximately up to 25% of military trainees, fighters and school-aged children experience some kind of dental trauma each year [5, 7]. The incidence of dental avulsion in school aged children ranges from 0.5 to 16% of all dental trauma. Many of these teeth are knocked-out during school activities or sporting events such as contact sports, football, basketball, and hockey and car accidents. Dental avulsion is a real dental emergency in which prompt management (within 20–40 minutes of injury) affects the prognosis of the tooth [6]. Failure to re-plant the avulsed tooth within the first 40 minutes after the injury may result in a less favorable prognosis for the tooth [2]. Often multiple teeth are knocked-out. If the injured victim bears serious injuries such as severely lacerated jaws and immediate teeth replantation is not possible, the teeth will lose their viability and the patient would be further deprived of having them replanted for life.

2. Hypothesis

When a tooth is knocked-out, the success of delayed replantation depends on the vitality of the cells remaining on the root surface. In normal conditions, a tooth is connected to the socket by means of the periodontal ligament. When a tooth is avulsed, the ligament stretches and splits in half [5]. Maintaining the vitality of the cells that remain attached to the root surface is the key to success following replantation. In adults with injuries like severely lacerated jaws in which immediate teeth replantation is not possible, avulsed permanent teeth can be preserved live inside patient's body flesh for afterwards replantation. Avulsed fresh teeth can be embedded in non-oral patient flesh; e.g. in subcutaneous superficial connective tissues of under armpit or lateral abdominal regions. The embedded teeth would not perish in patients flesh since the remaining periodontal ligament would receive nourishment *via* diffusion from their surrounding connective tissue, hence maintaining their viability. At proper later stages of OMS treatment, the embedded teeth would be removed and replanted in their original sockets. If its efficacy is proved in animal trials, this treatment will reduce the chance of loss of permanent teeth due to dental avulsion in many patients with accidents who go through complicated OMS treatments.

3. Clinical significance

Replantation of "in body-flesh embedded-teeth" is useful for patients with tooth loss due to dental avulsion whom cannot receive immediate replantation.

The clinical significances of such treatment include: 1) Restores teeth even after prolonged dental avulsion; 2) Promotes viability of embedded teeth; 3) Less need for non-live implants, 4) There would be no immunological incompatibility reactions; 5) May reduce the incidence of peri-implantitis [1] and 5) Promotes restoration of the periodontal ligaments. The disadvantage of this treatment is that the patient should go through extra surgeries to embed the avulsed teeth in body flesh and then remove it for replantation; however, it is the choice of patient or people in charge to agree with this treatment.

It should be noted that this treatment is for permanent teeth since management of injured primary teeth differs from management of permanent teeth; avulsed primary tooth should not be re-planted (to avoid damage to the permanent dental crypt) [3].

4. Future testing

Considering the application of this treatment, further studies are needed to confirm its restoration effects in clinical cases. The effectiveness of this treatment on long-term prognosis of replanted knocked out teeth depends on verification of the following criteria: 1) Enhanced success rate, compared to conventional treatment; 2) Reducing infection throughout rehabilitation period; 3) Restoration of the periodontal ligaments. These criteria should be verified firstly by animal experiments and research works needed to optimize the treatment. When these concerns are clear, I believe that it could be used as a technique to assist many patients of concern to regain their own original teeth. As this procedure evolves as a new OMS treatment, it requires meticulous care throughout the process for ensuring the operation to be successful. Hope to hear the best in future.

5. Conflicts of interest

I declare that I have no financial and personal relationships with other people or organizations that can inappropriately influence my work, there is no professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, the article entitled, "Embedding avulsed permanent tooth in patient's connective tissues insures better possible prognosis in replantation; a hypothesis".

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7. References

- Claffey, N., Clarke, E., Polyzois, I. & Renvert S. (2008). Surgical treatment of peri-implantitis. *J Clin Periodontol*, 35(Suppl. 8), 316–32.
- Flores, M.T., Andersson, L., Andreasen, J.O., Bakland, L.K., Malmgren, B., Barnett, F., Bourguignon, C., DiAngelis, A., Hicks, L., Sigurdsson, A., Trope, M., Tsukiboshi, M. & von Arx T. (2007). Guidelines for the management of traumatic dental injuries. II. Avulsion of permanent teeth. *Dent Traumatol*, 23 (3), 130–136.
- Flores, M.T., Malmgren, B., Andersson, L., Andreasen, J.O., Bakland, L.K., Barnett, F., Bourguignon, C., DiAngelis, A., Hicks, L., Sigurdsson, A., Trope, M., Tsukiboshi, M. & von Arx T. (2007). Guidelines for the management of traumatic dental injuries. III. Primary teeth. *Dent Traumatol*, 23 (4), 196–202.
- Huskey, R.W. (2009). Worried About Your Child Knocking Out a Tooth?. [Accessed on Feb 3th, 2012]. Available at: http://www.rwhuskey.com/dental_care.htm
- Krasner, P. & Rankow H. (1995). New philosophy for the treatment of avulsed teeth. *Oral Surg Oral Med Oral Pathol*, 79: 616–23.
- Zadik, Y. (2008). Algorithm of first-aid management of dental trauma for medics and corpsmen. *Dent Traumatol*, 24 (6), 698–701.
- Zadik, Y. & Levin L. (2009). Oral and facial trauma among paratroopers in the Israel Defense Forces. *Dent Traumatol*, 25 (1), 100–102.