

## [最近のトピックス]

## Tooth storage media for avulsed teeth

Md Riasat HASAN<sup>1</sup>, Nazmus SHALEHIN<sup>2</sup>, Kazuharu IRIE<sup>2</sup>, Takashi SAITO<sup>1</sup><sup>1</sup>Division of Clinical Cariology and Endodontology, Department of Oral Rehabilitation, Health Sciences University of Hokkaido<sup>2</sup>Division of Histology, Department of Oral Growth and Development, Health Sciences University of Hokkaido

Dental avulsion is the severe type of traumatic tooth injuries. After avulsion it causes damage to several structures of tooth. Immediate replantation is the ideal treatment for avulsed tooth. However, replantation is not always possible. The vitality of the periodontal ligament cells that remain on root surface is the key to success of replantation. To maintain periodontal ligament cell viability, an ideal tooth storage media is required. Ideal tooth storage medium may contribute to minimize the occurrence of root resorption or ankyloses. Recent research has led to the development of storage media that produce conditions that closely resemble the original socket environment, with adequate osmolality (cell pressure), pH, nutritional metabolites and glucose, and thus create the best possible conditions for storage. Currently highly recommended tooth storage medium is Hank's Balanced Salt Solution (HBSS), which is a standard saline solution that is widely used in biomedical research to support the growth of cell.

In some country tooth storage media is commercially available at the pharmacy, like "Save A Tooth" or "Teeth Keeper". They actually contain HBSS. But these are not available everywhere.

An easily available tooth storage media are water, saliva and milk. But none of them are ideal tooth storage medium for avulsed tooth.

Tap water is one of the media with least desirable results. It protects the tooth from dehydration for being a hypotonic medium. But it causes rapid cell lysis of the periodontal ligament. Saliva can be used as a storing medium for a short period of time. However it can damage the cells of the periodontal ligament if used for longer than an hour. Its osmolality (60–70 mOsm/kg), is much lower than the normal physiologic condition, thus, it boosts the harming effects of bacterium contamination. Easily availability is its only advantage. The American Association of Endodontics recommended milk as a solution for avulsed teeth, for keeping the

viability of the human cellular periodontal ligament. Some report says milk showed higher ankylosis.

Khademi et al. suggested that egg white is comparable to milk as a storage medium for avulsed teeth.

Recently we studied on egg white as tooth storage media, and found some bio-physiological result. The result suggested that bio-physiological properties of egg white, makes a compatible result with HBSS as short term tooth storage media, for avulsed teeth. We need further study to find out a proper tooth storage media, which will be easily available at any accidental site.

However, there is not yet a single solution that fulfills all the requirements to be considered as an ideal medium for temporary storage of avulsed teeth, and research on this topic should be carried on.

## Reference

- Ashkenazi M et al. *Dent Traumatol* 16 : 63–70, 2000.  
 Bloml'of L et al. *Swed Dent J* 8 : 1–26, 1981.  
 Gopikrishna V et al. *J Endod* 34 : 587–9, 2008.  
 Manuella V P R et al. *J Endod* 40–5 : 665–669, 2014.  
 Khademi AA et al. *Dent Traumatol* 24 : 510–514, 2008.  
 Krasner P et al. *J Sch Nurs* 8 : 20–6, 1992.  
 Krasner P et al. *J Am Dent Assoc* 23 : 80–8, 1992