Management of dental avulsion in a child with severe intellectual disability: Case report

Postępowanie w przypadku całkowitego zwichnięcia zęba u dziecka z ciężkim niedorozwojem umysłowym – opis przypadku

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation;

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Dental and Medical Problems, ISSN 1644-387X (print), ISSN 2300-9020 (online)

Dent Med Probl. 2017;54(2):213–216

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Funding sources

none declared

Conflict of interest

none declared

Received on November 28, 2016

Revised on April 06, 2017

Accepted on April 18, 2017

Abstract

The protocol for the management of dental avulsion is based on many factors including management of the emergency at the accident site, extraoral dry time, the transport medium for the avulsed tooth, the root development of the avulsed tooth, etc. The management can also vary depending on the mental maturation and ability of the child to cooperate. This is especially true if the child involved with the avulsion is a differently-abled child with severe mental retardation. Dental emergencies among children with special health care needs are very common and standard protocols for management may have to be modified when dealing with these children.

The following is a case report of the management of avulsion of bilateral permanent central incisors in a differently-abled child with severe mental retardation under general anesthesia. Emphasis is also placed on the post-operative management, which involved the chairside removal of the splint using intravenous sedation.

Key words: intellectual disability, tooth, avulsion

Słowa kluczowe: upośledzenie umysłowe, zęb, zwichnięcie

DOI

10.17219/dmp/70501

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The protocol for the management of dental avulsion is based on many factors including management of the emergency at the accident site, extraoral dry time, the transport medium for the avulsed tooth, the root development of the avulsed tooth, etc.¹ The management can also vary depending on the mental maturation and ability of the child to cooperate. This is especially true if the child involved with the avulsion is a child with special health care needs.

Dental emergencies among children with special health care needs are very common and standard protocols for management may have to be modified when dealing with these children.² Multiple visits involving extensive treatment is not practical in these children. The following is a case report of the management of avulsion of bilateral permanent central incisors in a child with severe intellectual disability under general anesthesia. Emphasis is also placed on the post-operative management, which involved the chairside removal of the splint using intravenous sedation.

Case report

A 12-year-old female patient with intellectual disability was brought to the Department of Pedodontics & Preventive Dentistry by her parents following trauma to the upper front region of the oral cavity. The child had had a fall from the staircase in school which resulted in avulsion of the upper anterior teeth. Following the trauma, the parents had contacted the dental hospital immediately. Instructions were given to store the teeth in cold milk and not attempt to scrub the teeth or remove the contaminants. The child reported along with the parents about an hour after the traumatic accident.

A thorough medical history was recorded and any neurological injuries were ruled out. The child, according to her medical records, was classified under the retardation category "severe" (IQ 20 to 40).³ She also had a history of epilepsy and was under regular medication for the same.

Fig. 1. Sockets in relation to 11 and 21

Fig. 2. Wire and composite splint

On intraoral examination, teeth 11 and 21 were avulsed and the sockets were bleeding without contamination. The avulsed teeth were held by the crown and carefully examined. They showed complete apices without any fracture to the crown or the root. Definitive treatment for replantation of the avulsed teeth was planned under general anesthesia.

The child was posted under general anesthesia following Nil Per Oral (NPO) instruction for 6 h.

Once under general anesthesia, the sockets were irrigated with Betadine and saline to aid in decontamination (Fig. 1). The protocol recommended by the International Association for Dental Traumatology (IADT) for avulsed teeth with an extraoral dry time of more than 60 min was followed.⁴ The soft debris on the root surface was gently removed. Extraoral root canal treatment was performed on both the teeth using rotary instruments (Densply XSmart™ Endodontic Rotary Motor - ProTaper® Universal Rotary Files) and obturated with gutta-percha cones.

Fig. 3. Post-operative radiograph of 11 and 21

Fig. 4. Follow up: 6th months

The teeth were then immersed in Acidulated Phosphate Fluoride (APF) gel for 20 min in order to slow down the osseous replacement of the root.

The teeth were then gently replanted into their respective sockets and splinted with a ligature wire and composite splint (Fig. 2).

Post-operatively, instructions for a soft diet, oral hygiene maintenance and prevention of further trauma were given to the parents.

The child was discharged the next day with post-operative antibiotics (Amoxycillin 500 mg – thrice daily for 5 days).

After 4 weeks, the child was scheduled for splint removal.⁵ An IntraOral Periapical Radiograph (IOPA) was recorded with the parents gently restraining the child (Fig. 3).

The splint removal also presented a challenge with this child. The parents were not keen on another session of general anesthesia. Considering that splint removal was a short procedure, it was decided to do the procedure under intravenous sedation with midazolam.

Fig. 5. Radiograph of 11 and 21 at 6th month follow up

Fig. 6. Radiograph of 11 and 21 at 15th month follow up

The dose administered was 0.1 mg/kg body weight of midazolam. The dose administered was 3.6 mg (calculated at the dose of 0.1 mg/kg body weight). The splint removal was accomplished chairside and the child was discharged on the same day.

The child is under regular follow up with radiographs scheduled every 3 months.

The 6th month review showed clinically asymptomatic 11 and 21 with normal periodontium, physiologic mobility and percussion sound. No signs of infection were seen (Fig. 4). However, the radiograph showed initial signs of replacement root resorption occurring in the mesial surface of 11. No abnormal bone changes were seen in relation to either of the teeth (Fig. 5).

The 15th month follow up radiograph (Fig. 6) revealed replacement resorption of both the central incisors. Clinically, no changes were observed in either of the teeth. Both teeth produced the typical dull sound on percussion.

Discussion

Ferreira et al. studied the prevalence of dental trauma in children with special health care needs and concluded that the prevalence of dental trauma is more common in permanent dentition.⁶ The prevalence of intellectual disability among children is 0.3–0.8%, but the prevalence of traumatic injuries in children with intellectual disability is about 20–30%. This may be attributed to epilepsy, which is very common in children with intellectual disability. Extensive treatment for such children can be completed only under general anesthesia. The American Society of Anesthesiologists (ASA) recommends NPO for light meal, infant formula and non-human milk as 6 h. Hence, the general anesthesia was induced after the recommended NPO, which also increased the extraoral time of the avulsed teeth.

The recent method of managing avulsed mature teeth is by promoting revascularization using PRP (Platelet Rich Plasma).⁷ However, the technique was not practical for our patient because of the associated medical disorder as it requires multiple visits.

It is suggested that immersing the tooth in substances like sodium fluoride can inhibit root resorption. The mechanism is that the fluoride ions in sodium fluoride gel can effectively get incorporated into the cementum and hence, resists root resorption. The other substances which can be used are: tetracycline, stannous fluoride, citric acid, hypochlorous acid, calcium hydroxide, formalin, alcohol, diphosphonates and indomethacin.⁸

The splint selected was semi-rigid to allow normal physiologic tooth mobility. Rigid stabilization can often lead to replacement resorption. A wire and composite splint is the most ideal and commonly-used splint following replantation and also helps in maintaining good oral hygiene compared to other splints.⁸ The choice of dental treatment in children with special health needs depends on various factors such as: masticatory efficiency, nutritional requirements, aesthetics, functions (phonation, etc.), parents' psychology, etc. Replantation should be considered as the first line of management following avulsion. The patient had a history of epilepsy and hence, removable of partial denture was contraindicated.⁹ A recent review by Romero-Pérez et al. compiled evidence and supports implant-supported prosthesis for children with special health needs.¹⁰ Since replantation favors the future possibility for implant placement, an attempt was made to splint and retain the teeth in position with the best possible care.

It has been stated by Andreasen that the initial radiographic signs of replacement resorption can be seen as early as 2 to 6 months.⁸ The patient had shown radiographic signs of replacement resorption in the 6th month follow up. It was not possible for the patient to visit the dental clinic for regular checkup. The 15th month radiographic evaluation revealed significant replacement resorption.

Conclusion

Dental trauma in children with special health needs is very common due to poor motor coordination. The conventional treatment plans for dental traumatic injuries should be modified and customized to each individual presenting situation. A thorough knowledge of the recent recommendations and management strategies could help the clinician in making the correct treatment plan.

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