

Guidelines for the management of traumatic injuries in the primary dentition



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The guidelines represent the current best evidence based on literature research and professional opinion. As is true for all guidelines, the health care provider must apply clinical judgment dictated by the conditions present in the given traumatic situation. The IADT does not guarantee favorable outcomes from following the Guidelines, but using the recommended procedures can maximize the chances of success.

Introduction

The management of traumatic injuries to primary teeth differs from that used for permanent teeth. It is important to keep in mind that there is close relationship between the apex of the root of the injured primary tooth and the underlying permanent tooth germ. Tooth malformation, impacted teeth and eruption disturbances in the developing permanent dentition are some of the consequences that can occur following severe injuries to primary teeth and/or alveolar bone. Because of this potential sequelae treatment selection should be such as to avoid any additional risks of further damaging the permanent successors.

The child's maturity and ability to cope with the emergency situation, the time for shedding of the injured tooth and the occlusion, are important factors that influence treatment selection.

The Guidelines contain recommendations for diagnosis and treatment of traumatic injuries in the primary dentition for caries-free or sound primary teeth using proper examination procedures:

A. Clinical Examination.

Information about examination of traumatic injuries in the primary dentition can be found in a number of current textbooks (links).

B. Radiographic examination

Depending on the child's ability to cope with the procedure and the type of injury suspected, several angles are recommended:

1. 90° horizontal angle, with central beam through the tooth in question (size 2 film, horizontal view)
2. Occlusal view (size 2 film, horizontal view)
3. Extra-oral lateral view of the tooth in question, which is useful to reveal the relationship between the apex of the displaced tooth and the permanent tooth germ as well as the direction of dislocation (size 2 film, vertical view).

C. Patient instructions

Good healing following an injury to the teeth and oral tissues depends, in part, on good oral hygiene. Parents should be advised on how best to care for their children's primary teeth after an injury.

Brushing with a soft brush after each meal and applying chlorhexidine (0.1%) topically to the affected area(s) with cotton swabs twice a day for one week, is beneficial to prevent accumulation of plaque and debris. Along with recommending a soft diet for 10 to 14 days, restrict the use of pacifier.

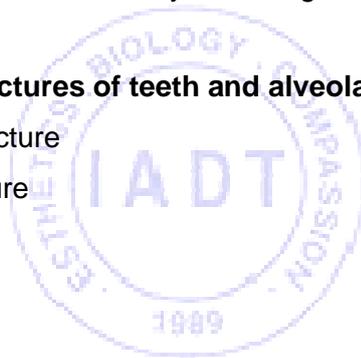
If there are associated lip injuries, use of lip balm during the healing period will avoid dryness.

Parents should be further advised about possible complications that may occur, like swelling, increased mobility or fistula. Children may not complain about pain; however, infection may be present and parents should watch for signs such as swelling of the gums and bring the children in for treatment.

Document in the chart that the parent has been informed about possible complications in the development of the permanent teeth, especially following intrusion, avulsion and alveolar fracture injuries sustained in children under 3 years of age.

1. Treatment guidelines for fractures of teeth and alveolar bone

- Uncomplicated crown fracture
- Complicated crown fracture
- Crown-root fracture
- Root fracture
- Alveolar fracture



2. Treatment guidelines for luxation injuries

- Concussion
- Subluxation
- Extrusive luxation
- Lateral luxation
- Intrusive luxation
- Avulsion

PRIMARY TEETH**1. Treatment guidelines for fractures of teeth and alveolar bone****Uncomplicated Crown Fracture**

Clinical findings	Radiographic findings	Treatment
Fracture involves enamel or dentin and enamel; the pulp is not exposed.	The relation between the fracture and the pulp chamber will be disclosed.	Smooth sharp edges. If possible the tooth can be restored with glass ionomer filling material or composite.

Complicated Crown Fracture

Clinical findings	Radiographic findings	Treatment
Fracture involves enamel and dentin and the pulp is exposed.	One exposure is useful to rule out the extent of fracture and stage of root development.	In very young children with immature, still developing roots, it is advantageous to preserve pulp vitality by pulp capping or partial pulpotomy. This treatment is also the choice in young patients with completely formed roots. Calcium hydroxide is a suitable material for such procedures. Both treatments should be considered whenever possible, otherwise extraction is indicated.

Crown-Root Fracture

Clinical findings	Radiographic findings	Treatment
Fracture involves enamel, dentin and root structure; the pulp may or may not be exposed. Additional findings may include loose, but still attached, fragments of the tooth. There is minimal to moderate tooth displacement.	In laterally positioned fractures, the extent in relation to the gingival margin can be seen.	Treatment recommendation is tooth extraction. Care must be taken to prevent trauma to the subjacent tooth bud.

Root Fracture

Clinical findings	Radiographic findings	Treatment
The coronal fragment is mobile and may be displaced.	The fracture is usually located mid-root or in the apical third.	If the coronal fragment is displaced, extract only that fragment. The apical fragment should be left to be resorbed.

Alveolar Fracture

Clinical findings	Radiographic findings	Treatment
The fracture involves the alveolar bone. The tooth-containing segment is mobile and usually displaced. Occlusal interference is often noted	The horizontal fracture line to the apices of the primary teeth and their permanent successors will be disclosed. A lateral radiograph may also give information about the relation between the two dentitions and if the segment is displaced in labial direction.	Reposition any displaced segment and then splint. General anesthesia is often indicated. Monitor teeth in fracture line.

2. Treatment Guidelines for Luxation Injuries

Concussion

Clinical findings	Radiographic findings	Treatment
The tooth is tender to touch; it has no increased mobility or sulcular bleeding.	No radiographic abnormalities. Normal periodontal space.	No treatment is needed. Observation.

Subluxation

Clinical findings	Radiographic findings	Treatment
The tooth has increased mobility but has not been displaced. Bleeding from gingival crevice may be noted.	Radiographic abnormalities are usually not found. Normal periodontal space.	No treatment is needed. Observation.

Extrusive luxation

Clinical findings	Radiographic findings	Treatment
The tooth appears elongated and is excessively mobile.	Increased periodontal ligament space apically.	Treatment decisions are based on the degree of displacement, mobility, root formation and the ability of the child to cope with the emergency situation. For minor extrusion (< 3mm) in an immature developing tooth, careful repositioning or leaving the tooth for spontaneous alignment are acceptable treatment options. Extraction is the treatment of choice for severe extrusion In a fully formed primary tooth.

Lateral luxation

Clinical findings	Radiographic findings	Treatment
The tooth is displaced, usually in a palatal/lingual direction. It will be often immobile.	Increased periodontal ligament space apically is best seen on the occlusal exposure.	<p>If there is no occlusal interference, as is often the case in anterior open bite, the tooth is allowed to reposition spontaneously. When there is occlusal interference, with the use of local anesthesia, the tooth can be gently repositioned by combined labial and palatal pressure.</p> <p>In severe displacement, when the crown is dislocated in a labial direction, extraction is the treatment of choice. If minor occlusal interference, slight grinding is indicated.</p>

Intrusive luxation

Clinical findings	Radiographic findings	Treatment
The tooth is usually displaced through the labial bone plate, or can be impinging upon the succedaneous tooth bud.	<p>When the apex is displaced toward or through the labial bone plate, the apical tip can be visualized and appears shorter than the contra lateral tooth.</p> <p>When the apex is displaced towards the permanent tooth germ, the apical tip cannot be visualized and the tooth appears elongated.</p>	<p>If the apex is displaced toward or through the labial bone plate, the tooth is left for spontaneous repositioning.</p> <p>If the apex is displaced into the developing tooth germ, extract.</p>

Avulsion

Clinical findings	Radiographic findings	Treatment
The tooth is completely out of the socket.	A radiographic examination is essential to ensure that the missing tooth is not intruded.	It is not recommended to replant avulsed primary teeth.



Follow up procedures for traumatized primary teeth

Time		1 week	2-3 weeks	3-4 weeks	6-8 weeks	6 months	1 year	Each subsequent year until exfoliation
Uncomplicated crown fracture				C				
Complicated crown fracture		C			C+R		C+R	
Alveolar fracture		C		S+C+R	C+R		C+R	(*)
Root fracture	No Displacement	C	C+R		C+R		C(*)	
	Extraction						C(*)	
Concussion/ Subluxation		C			C			
Lateral luxation Extrusion	Spontaneous repositioning		C		C+R		C+R	
Intrusion		C		C+R	C	C +R	C+R	C(*)
Avulsion		C				C +R	C+R	C(*)

S= Splint removal

C = Clinical exam R= Radiographic exam

(*)= Radiographic monitoring until eruption of the permanent successor

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