

Management of Dental Trauma in Children

Daniel Ford

BDS Sc (Hons); BSc (Hons); MDS Sc (Paed); FRACDS

Paediatric Dentist



Classification of trauma

- Injuries to the hard dental tissues & pulp:
 - Enamel infraction
 - Enamel fracture
 - Enamel-dentine fracture
 - Complicated crown fracture

Classification of trauma

- Injuries to the hard dental tissues, pulp & alveolar process:
 - Crown root fractures
 - Root fracture
 - # alveolar socket wall
 - # of alveolar process

Classification of trauma

- Injuries to Periodontal tissues:
 - Concussion
 - Subluxation
 - Luxation (extrusion, lateral, intrusion)
 - Avulsion

Classification of trauma

- Injuries to gingiva or oral mucosa:
 - Laceration
 - Tear
 - Abrasion
 - superficial wound
 - rubbing or scraping
 - raw, bleeding surface
 - Contusion

Classification of trauma

- Almost always, there is a combination of injuries ... eg crown fracture and subluxation injury and gingival laceration

General approach to trauma

- Triage
 - Assess level consciousness
 - Other injuries
 - Oro-facial injuries
- Clean
- Records and Documentation
- Stabilise
- Treat
- Remain calm

History
Examination
Diagnosis

History

- Where, When, How?
- Medical
- Dental – including previous trauma
- History of signs and symptoms of trauma

Examination

- Emergency – DRABC, cervical, cerebral, haemorrhage
- General
- Extra-oral
- Intra-oral soft
- Intra-oral hard
 - might include visual, pulp sensibility, TTP, mobility, colour, probe, sound
- Periodontium
- Radiographic
 - might include OPG, PA, Mx/Md occ, soft tissue (25% exposure), lateral Mx
- Other

Diagnosis

- Must be made prior to treatment
- Xxxx due to Yyyy; consistent with Zzzz
- For example: Luxation injury (palatal displacement) of 61 and contusion of upper lip due to trauma; consistent with fall onto hard object

Enamel Fracture

- Primary and permanent dentition
 - Smooth sharp edges
 - Restorative - strip crown

Enamel and Dentine Fracture

- Primary dentition
 - Restorative – strip crown
- Permanent dentition
 - Restorative
- Seal dentine tubules

Complicated Crown Fracture

- Primary dentition
 - Pulp capping – only if very small exposure and treatment is immediately after injury, then strip crown
 - Pulpotomy, then strip crown
 - Pulpectomy, root fill, then strip crown
 - Extraction

Complicated Crown Fracture

- Permanent dentition
 - Pulp capping
 - Pulpotomy, then restorative
 - Pulpectomy, ? apexification, root fill, then restorative
 - Extraction – very rarely

Crown-Root Fracture

- Primary dentition
 - Uncomplicated:
 - Restorative – strip crown; or
 - Extraction
 - Complicated:
 - Pulpotomy or pulpectomy, then restorative – strip crown; or
 - Extraction

Crown-Root Fracture

- Permanent dentition
 - Treatment options to consider:
 - RCT
 - Extrusion
 - Perio surgery
 - Restorative
 - Extraction and management of the space
 - Very complicated and time consuming

Root Fracture

- Primary dentition
 - If no significant mobility of coronal fragment
 - No immediate treatment indicated ... review
 - Splinting not necessarily indicated / achievable
 - If displaced or very mobile coronal fragment
 - Extract the entire tooth; leave small apical fragment if risk of damage to successor

Root Fracture

- Permanent dentition
 - If mobile coronal fragment
 - Traditional regimen: rigid fixation for up to 2 months
 - More recent regimen: flexible fixation for 2-3 weeks
 - If fracture is at CEJ, exo of coronal fragment may be indicated ... need to then consider root burial, ortho extrusion, exo of root

Root Fracture

If coronal fragment relatively firm ...
no splint may be necessary

Review for type of healing:

- Fracture
 - healing with calcified tissue
 - healing with connective tissue
 - bone and connective tissue
 - granulation tissue

- Pulp
 - revascularisation
 - necrosis
 - pulp canal obliteration.



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Concussion and Subluxation

- Primary and permanent dentition
 - Observation only
 - Splinting not indicated / achievable
 - Soft diet

Luxation

- Primary dentition
 - Extrusive luxation:
 - Extraction is indicated ... do not reposition
 - Lateral luxation:
 - If not excessive mobility and if not in traumatic occlusion, leave to allow spontaneous repositioning (via forces from tongue and lip)
 - If excessive mobility or if in traumatic occlusion, extraction is indicated

Luxation

- Permanent dentition
 - Disimpaction of the luxated tooth
 - Management of the alveolar fracture
 - Reposition tooth
 - Non-rigid splinting 10-14 days
 - High probability of need for RCT in mature teeth

Intrusion

- Primary dentition
 - Do not extrude physically or orthodontically
 - Direction of displacement
 - If apex of primary tooth has been displaced palatally, into developing permanent tooth, extraction is indicated
 - If apex of primary tooth has been displaced labially, away from developing permanent tooth, defer to severity of displacement criteria
 - If apex has been displaced labially and has fractured the labial bone plate (as seen on lateral Mx film), extraction is indicated ... virtually no chance of spontaneous eruption.
 - Severity of displacement
 - If less than half crown has been intruded, good chance of spontaneous eruption over the next three months ... leave and monitor
 - If half crown has been intruded, possibility of spontaneous eruption is reduced ... allow time for spontaneous eruption, but consider extraction
 - If more than 75% of crown has been intruded, possibility of spontaneous eruption is very low ... extraction is indicated.

Intrusion

- Primary dentition
 - How do you determine the direction of displacement?
 - Mx Occ: Primary tooth will appear foreshortened if it has been displaced labially
 - Mx Occ: Primary tooth will appear elongated if it has been displaced palatally
 - Lateral Mx film: Identify the position of apex of primary tooth in relation to permanent crown
 - Mx Occ or PA: Appearance of developing permanent tooth should be normal and virtually the same as the contralateral tooth.

Intrusion

- Permanent dentition
 - Options include:
 - passive re-eruption,
 - surgical repositioning, or
 - orthodontic repositioning
 - Two schools of thought:
 - Treatment based on age/stage of root development
 - Treatment based on severity of intrusion

Intrusion

- Permanent dentition
 - Treatment based on age/stage of root development
 - Immature tooth: left to re-erupt over 6 months, for sake of pulp, PDL and marginal bone
 - Mature teeth up to 17 yoa: left to re-erupt over 6 months, for sake of pulp, PDL and marginal bone
 - Mature teeth older than 17 yoa: reposition surgically or orthodontically

Intrusion

- Permanent dentition
 - Treatment based on severity of intrusion
 - < 3 mm: leave to re-erupt spontaneously
 - 3-6 mm: either leave to re-erupt spontaneously or apply traction to reposition
 - > 6 mm: surgical or orthodontic repositioning is necessary; inevitable that there will be eventual loss of the tooth due to ankylosis and replacement resorption.

Intrusion

- Permanent dentition
 - Need for RCT, particularly in nearly mature or mature teeth is almost inevitable. Focus should be on achieving re-eruption to enable endodontic access.

Avulsion

- Primary dentition
 - Never reimplant

Avulsion

- Permanent dentition
 - Considerations:
 - Extra-alveolar time
 - Storage medium
 - Stage of development
 - Treatment:
 - Clean
 - Reimplant
 - Non-rigid splint 7-10 days
 - RCT is inevitable if mature and probable if immature

Injury to the developing permanent dentition secondary to injury to the primary dentition

- Approx half of all injuries to a primary tooth cause some form of injury to the developing permanent successor
- Types of injury to primary teeth to consider:
 - Intrusion of the primary tooth
 - Luxation of the primary tooth
 - Injury leading to primary tooth pulp death and ultimate necrosis, giving rise to apical periodontitis
- Types of injury that may be caused to the permanent successor
 - Enamel hypomineralisation – white, yellow or brown opacity
 - Enamel hypoplasia – physical defect
 - Crown or root dilaceration
 - Partial or complete arrest of root formation
 - Odontome formation

Additional treatment

- Cleaning
- Chlorhexidine
- Analgesics as indicated
- Antibiotics as indicated
- Tetanus prophylaxis as indicated
- Follow up

Loss of vitality in immature teeth - Revascularisation