A step-by-step guide to managing dental trauma in general practice

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Dental trauma management in general practice

The management of dental trauma can be a very challenging and overwhelming experience especially in general practice. This is mainly due to a lack of experience or updated knowledge based on revised guidelines. It is important for dental professionals to understand how to best manage dental trauma, especially in the acute phase, as this will result in improved long term outcomes for the patient. This article aims to highlight the main principles of dental trauma management and it will signpost resources to help update your knowledge and boost your confidence.

1. Ensure that you take a detailed history and carry out a thorough clinical examination of the face, soft tissues and teeth

When managing dental trauma, especially acutely, it is important to perform a detailed and systematic assessment. Partly this is to eliminate other injuries such as brain injury and facial fractures such as mandible, orbital or zygomatic arch fractures and partly to ensure a clear plan is made for the short and long-term management of the traumatised tooth. A general facial examination can be done by gently palpating the facial structures such as the infraorbital rim, cheek bones, nose, maxilla and the lower border of the mandible. Note any asymmetry (such as flattening of the cheek bones), step deformities or tenderness. It is important to also assess the occlusion and jaw movements as well. Step deformity of the lower border of the mandible, gingival tear and sublingual haematoma (bruising) is suggestive of a mandible fracture. For more detailed information on history taking as well as clinical and radiographic examination refer to the Saving Smiles Practitioners' Toolkit[1] or the article by Chauhan *et al.*[2]

2. Consider a prompt referral to the local maxillofacial department by sign posting or contacting the on-call team

If there are signs of brain injury such as loss of consciousness, vomiting or nausea the patient should be urgently referred to A&E for further assessment. If you suspect signs of facial fractures or if there is a deep or complex laceration that you do not feel comfortable treating, or it requires decontamination, consider referral to the maxillofacial department. If the patient has any eye signs such as pain behind the eyes, proptosis [protrusion of the eyeball] or loss of vision, an urgent referral is needed to the maxillofacial department and for an urgent ophthalmology assessment. If the tooth fragment cannot be located and the patient has symptoms, a chest X-ray must be considered to investigate whether the fragment has been inhaled. For more information on maxillofacial referral considerations and how to manage simple soft tissue injuries and lacerations in practice you can refer to the Saving Smiles Practitioners' Toolkit.[1]

3. Make a correct dental trauma diagnosis

In order to make sure the traumatised tooth is treated appropriately both acutely and in the long term it is important to classify and diagnose the type of dental injury. This is done through thorough clinical and radiographic examination. Two radiographic views are ideal: periapical and occlusal views. This is firstly to establish whether it is a primary or permanent tooth. Then, to make a correct diagnosis, it is important to have a good understanding of the different classifications of dento-alveolar injuries. There are two main types of dental injuries: luxation and fractures. Be aware of the clinical and radiographic signs of each and for more information about dental trauma classification visit the Dental Trauma Guide.[3]

4. Carry out appropriate acute management

Once the dental injury has been appropriately diagnosed, timely acute management of the

tooth is critical as early intervention can improve outcomes. Effective management is dependent on achieving good local anaesthesia.[2] This differs according to the type of injury. In this section, the most complex injuries and those which have been recently updated will be outlined. For information on those which are not covered in this section refer to the Dental Trauma Guide[3] for detailed information about dental trauma management and the updated IADT guidelines.[4,5,6]

Splinting

The following dental injuries in the permanent dentition require splinting: avulsion, intrusion, extrusion, lateral luxation, alveolar fractures and displaced root fractures. Non rigid or flexible splint placement aims to immobilise and stabilise the tooth in the correct position to avoid further damage and allow healing. In the primary dentition splinting is indicated if there are signs of alveolar fracture. Each type of dental injury requires a different splinting time otherwise the risk of ankylosis increases. Table 1 summarises the length of time needed to splint the traumatised tooth for each type of injury.

The most common method of splinting is using composite and wire (wire of a diameter up to 0.016" or 0.4 mm stainless steel is ideal) placed one tooth either side of the injured tooth. Make sure to reposition the tooth, check the occlusion, take a radiograph to ensure the splinted tooth is correctly positioned in the socket and lastly, splint the traumatised teeth.[5] After the specific splinting time is over, the splint and composite should be removed, and long-term management initiated. For detailed step by step emergency management of each type of injury and a clinical guide to simple splinting refer to the Saving Smiles Practitioners' Toolkit,[1] the article by Chauhan *et al.*[2] and the updated IADT guidelines.[4,5,6]

Avulsion

A permanent avulsed tooth must always be reimplanted. An avulsed tooth should be picked up by the crown. If it is dirty, it must be gently rinsed in milk, saline or the patient's saliva before immediate reimplantation. The patient must bite on a handkerchief to hold the tooth in place. If reimplantation at the accident site is not possible the tooth must be stored in either milk, saliva or saline until reimplantation by a clinician. Once the patient has attended the clinic, confirm the repositioning of the tooth both clinically and radiographically. Correct any mispositioning using gentle finger pressure under local anaesthesia up to 48 hours after the incident. If the tooth has not been reimplanted at the site, clean the socket first and remove any blood clots.[5]

Table 1 Recommended splinting time for each type of dental injury

Type of injury	Splinting time
Lateral luxation	4 weeks
Extrusion	2 weeks
Intrusion	4 weeks
Alveolar fracture	4 weeks
Avulsion (EODT <60 minutes)	2 weeks
Avulsion (EODT >60 minutes)	2 weeks
Apical 1/3 root fracture	4 weeks
Mid 1/3 root fractured	4 weeks
Cervical 1/3 root fracture	4 months (rigid splinting is recommended)
Type of injury	Splinting time
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Apical 1/3 root fracture	4 weeks
Mid 1/3 root fractured	4 weeks
Cervical 1/3 root fracture	4 months (rigid splinting is recommended)

It is crucial to note that based on the recent update of the IADT guidelines 2020,[5] all isolated avulsion injuries are now splinted for two weeks regardless of the extra oral dry time (EODT). In cases of associated alveolar bone fracture four weeks of splinting is advised.

Endodontic treatment must be initiated within two weeks before the splint is removed in teeth with closed apices. In teeth with open apices, there is a high chance that pulp space revascularisation may occur. Therefore, root canal treatment should only be initiated if there are clinical and radiographic signs of pulp necrosis on follow up examination.[5]

Uncomplicated crown fractures

In enamel-dentine fractures without pulpal exposure or uncomplicated crown fractures, if the fragment is available it can be reattached using resin composite, otherwise the tooth should be restored using direct composite placement which is preferred over temporary glass ionomer bandage.[2]

Complicated crown fractures

If there is pulpal exposure, all attempts should be made to maintain tooth vitality. Under local anaesthesia and isolation, 2-3 mm of pulp tissue is removed through the exposure using a small round diamond bur. Using a cotton wool pledget soaked in sodium hypochlorite apply pressure to clean the area and stop the bleeding then apply non-setting calcium hydroxide or MTA. Then apply glass ionomer and restore the tooth by either reattaching the fragment or build up with composite. If the pulp does not stop bleeding remove a further 1 mm and apply pressure until haemostasis is achieved. If haemostasis of pulp cannot be achieved, it indicates that the pulp is irreversibly inflamed, and a full pulp tissue removal or extirpation is required. For more information on how to carry out the Cvek partial pulpotomy technique to preserve tooth vitality and for guidance on how to treat other fracture types refer to the Saving Smile Practitioners' Toolkit.[1]

Table 2 Recommended recall intervals from time of injury for fractures and luxation injuries

Injury type	Follow up times
Complicated and uncomplicated crown fractures	3 months, 6 months, yearly
Complicated and uncomplicated crown-root fractures	3 months, 6 months, yearly
Root fractures	4 weeks, 3 months, 6 months, yearly
Intrusion	4 weeks, 3 months, 6 months, yearly
Extrusion	2 weeks, 6 weeks, 3 months, 6 months, yearly
Avulsion EODT <60 minutes	2 weeks, 4 weeks, 2 months, 6 months, yearly
Avulsion EODT >60 minutes	2 weeks, 4 weeks, 2 months, 6 months, yearly
Lateral luxation	4 weeks, 3 months, 6 months, yearly

Root fractures

Under local anaesthesia, the coronal fragment should be digitally repositioned then check the occlusion before splint placement. For apical and middle third fractures, four weeks of non-rigid splinting is needed but cervical third fractures require four months.[4]

Give appropriate aftercare advice

Appropriate aftercare advice includes: soft diet for 2-4 weeks, maintain good oral hygiene, gently brush 2 x times daily as normal, rinse gently with chlorhexidine mouthwash 2-3 times daily for 14 days, take painkillers as and when required, finish the course of antibiotics if prescribed, avoid participation in contact sport and follow up tetanus status with your GP (if injury happened where there was soil). Consider giving a patient information leaflet, of which there are a number available, to help them retain the information.[7] In addition, it is important to inform the patient or the parent of the possible sequalae of primary or permanent dental trauma.

Note that the use of systemic antibiotics after avulsion and reimplantation is recommended to prevent infection, as often the avulsed tooth becomes contaminated by bacteria and it will also help to decrease the occurrence of inflammatory root resorption. Amoxicillin is considered as first line.[5]

5. Appropriate clinical follow-up and long-term management

Generally, after acute management of the dental injury regular review at specific time intervals is important. Not only is this important in the short term but close monitoring in the long term is also vital to the successful management of these cases. The aim of recall is to monitor healing and to check signs and symptoms of necrosis. Table 2 summarises injury specific follow up times. The aim of long-term management is to maintain pulp vitality and therefore at each review appointment discolouration, mobility, tenderness to palpation and percussion, sinus, sensibility testing and radiographic assessment are needed.[1,2]

Endodontic therapy should only begin if there are two or more signs (discolouration, tender to percussion, buccal tenderness, presence of sinus, negative response to sensibility testing and radiographic evidence of periapical radiolucency or widening of PDL) or symptoms (spontaneous pain or pain on biting) of loss of vitality or pulp necrosis. However, in intrusion and avulsion injuries endodontic treatment (extirpation) should be started within 7-10 days in teeth with closed apices. Obturation can be completed once the splint has been removed. For root fractures root canal therapy is carried out up to the fracture line.[1,2]

6. Consider referral to secondary care for long term management

All general dental practitioners should be competent in assessment, diagnosis and management of dental trauma. The acute management can have a significant impact on the long-term prognosis of the traumatised tooth; therefore, it is essential that dentists make all efforts to manage all dental injuries immediately and in the long term. However, in higher risk injuries such as lateral luxation, intrusion and dento-alveolar fractures where management can be challenging referral to secondary specialist services can be considered for a second opinion or long-term treatment.

In conclusion, at times dental trauma can be complicated to manage, however, dental professionals have the skills and resources available to be able to confidently manage these cases. An important point to remember is that when treating children, the focus should be the child and not the tooth. In the early stages of management, the child is often upset from the experience of dental trauma and dental treatment at this point can lead to dental anxiety. Some cases are more complex, and it is important to note that there is always the option to refer or to liaise with a local paediatric specialist if needed.

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