



Orofacial Traumatism in Paediatric Dentistry

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ABSTRACT: Justification: diverse types of oral and maxillofacial traumas can occur in childhood, presenting varying degrees of complexity, and in some simpler cases it can be treated in a dental clinic or outpatient clinic, but there are some that can only be treated in specialized hospitals, requiring multidisciplinary teams. The paediatric dentist must recognise the type of trauma to resolve them or refer the patient to specialized teams. **Objective:** to show an overview of orofacial trauma in paediatric dentistry and the care involved. **Methodology:** explanatory and bibliographical research, carried out in the Virtual Health Library and Scielo, with the descriptors Trauma/AND/Orofacial/+/Childhood, deciduous teeth/+/Trauma and Paediatric dentistry/AND/Trauma, in Portuguese, English and Spanish, and research in university libraries of Dental Schools, and the professional experience of the authors. **Conclusion:** Oral and maxillofacial trauma can cause psychological trauma, both in the patient and in the parents, who start to overprotect their children, and this needs to be worked on by the paediatric dentist, both in preventive matters and with the least traumatic treatments possible and with humanizing attitudes. Another consequence is of an aesthetic nature, in this sense, it is necessary campaigns clarifying about risks, how to avoid them and procedures for parents, teachers and caregivers so that complications do not occur; toys and parks that guarantee the safety of children when playing, respect for traffic laws by drivers; child safety campaigns, among others, to reduce the rates of childhood trauma.

Key-Works: Dental trauma, Paediatric Dentistry, Orofacial traumatism, maxillofacial, Maxillofacial surgery.

1. INTRODUCTION

Various types of orofacial trauma can occur in childhood and adolescence, and can be caused by the following etiological factors:

domestic accidents, such as: falls, running or fighting games, collisions, accidentally biting a solid object, colliding with an object, burns, domestic violence, among others, or outside home, for example: sports, laser, car accidents, motorcycle accidents, cycling accidents, urban violence, collisions, falls, among others. Some of these accidents can be resolved on an ambulatory basis and others only in hospitals, by the dentist or a multidisciplinary team, depending on the severity of the case.

Trauma can compromise different regions with their respective bone structures, considering that the face has complex structures of bones, nerves, arteries, veins, and important muscles, not only for chewing, swallowing, speaking, but also for mimicry and facial expression, which in the latter case severely compromises the patient's psychosocial behavior¹.

When the accident involves a child, behavioral issues must be observed very carefully, as it is not just the child who appears afraid, nervous, impatient, and often aggressive, resulting from the pain. However, accompanying family members, parents, grandparents, etc., present, in most cases, similar behavior, however, added to feelings of guilt, compassion, among others. Given this, containment and treatment become more complex.

The diagnosis, decision and therapy must be as precise and immediate as possible, alleviating sequelae, fears and psychological traumas that may arise due to the prolongation of pain and exposure of the injury. Humanised care must cover both segments: the injured person and the companion.

The team of professionals who deal with this type of trauma must be well trained, have humanizing ethics, resistance to pressure, speed in decision making, self-control and up-to-date knowledge of the therapies applied to the case.

The most frequent traumas are: alveolar dental injuries, usually avulsion, dental



concussion, desinsertion, coronary fracture with pulp exposure, enamel fracture, mandible fracture, radicular fracture, fracture of enamel and dentin (especially in upper incisors), fracture of the lower third of the face, laceration of soft tissue such as labium and tongue, luxation with lateral dislocation, extrusive luxation, intrusive luxation, subluxation, deep enamel crack, and others. However, when it comes to car accidents, mandible fractures can occur, among other serious issues. In the case of adolescents, this severity may be related to facial trauma, which may be a consequence of car accidents, extreme sports, urban violence, among others.

The International Association of Dental Traumatology establishes evidence-based protocols that serve as guidelines for many paediatric dentists in the United States and other countries to treat orofacial trauma.

Some traumas have an increased risk factor due to the patient being young, overjet, inadequate lip seal, failure to use Personal Protective Equipment suitable for sport, leisure or even the means of transport used (bicycle, motorcycle, car, etc.), among others.

The objective is to show an overview of orofacial trauma in paediatric dentistry and the care involved. The methodology was explanatory and bibliographic research. The bibliographic part was in the Virtual Health Library and Scielo, with the descriptors Trauma/AND/Orofacial/+/Infancy, Deciduous teeth/+/Trauma and Paediatric dentistry/AND/Trauma, in Portuguese, English and Spanish languages, as well as research in university libraries on Dentistry Courses, and the authors' professional experience.

II. ANAMNESIS

In the anamnesis in trauma, many questions must be immediate, and others can be collected later. Immediate: When did the accident occur? How did the accident happen? Was there a loss of consciousness? low age, low weight of the patient, possible anaesthetic and drug allergies, immunological diseases, systemic diseases, comorbidities, medications administered and other information that the professional considers necessary for emergency care. Depending on the patient's age and/or the patient's state of consciousness and psychological reaction, information will be provided through parents or companions.

“Some information collected from the patient and the person responsible regarding how the injuries occurred, important data for the diagnostic conclusion, may be inaccurate. This is

possible because the person responsible for the child and adolescent often does not remember or does not know exactly how the trauma occurred.”².

Attention is emphasized to correctly filling out medical records, as the data explored during the anamnesis are important for the development of studies and/or implementation of services aimed at emergency care and/or educational/preventive campaigns for patients, victims of alveolus-dental trauma³.

After urgent or emergency care, the anamnesis can be completed, with full name, name of the father and mother, education, place of birth, details about the birth, height, weight, age, personal and special characteristics of dental importance, pathologies that the patient has already presented, family pathologies that may manifest themselves in the patient, medications used, allergies, among other data⁴. In addition, data such as: eating habits, mode and frequency of oral hygiene, details about the fluoride prophylaxis that has been carried out up to the moment of the consultation and functional problems observed by parents and/or caregivers (e.g. sucking or biting the lips, grinding teeth, among others), determine the frequency and moment of pain, possible illnesses, accidents that have already occurred, etc⁵.

III. AMBULATORY CARE

Traumatic dental injuries (TDIs) occur frequently in children and young adults, comprising 5% of all injuries. Twenty-five percent of all school children experience dental trauma and 33% of adults have experienced trauma to the permanent dentition, with the majority of the injuries occurring before age 19. Luxation injuries are the most common TDIs in the primary dentition, whereas crown fractures are more commonly reported for the permanent teeth. Proper diagnosis, treatment planning and follow up are important to assure a favorable outcome⁶.

Trauma brings with it a social cost, such as non-participation in various school events (for children) or work events (for parents), in addition to damage to self-esteem. There are also financial considerations involving complex restorative and endodontic treatments for teeth that, in some cases, have a very poor prognosis⁷.

The measurement of vital signs both in the outpatient clinic and in the office is important in any situation, in this sense the paediatric dentist must observe that the temperature: normal (normothermic) axillary is 35.8°C to 37°C, oral temperature is 36, 3°C to 37.4°C and rectal temperature of 37°C to 38°C; reference values for resting pulse rate: Adults 60 to 100 beats per



minute (bpm), children 80 to 120 bpm and babies 100 to 160 bpm. It can be measured through the carotid or radial artery, however, there are alternatives, such as: temporal, facial, cubital, ulnar, femoral, popliteal, foot, cardioapical, among others. It should be noted that the pulse rate is related to the respiratory rate of 1:4; Respiratory rate (RR) should be counted per minute, or count for 30 seconds and multiply by 2: normal (eupnea) in adults is 12 to 20 inspirations per minute, for neonates 40 to 45 inspirations/min and babies up to

2 years old ages 25 to 35 inspirations/min, children aged 2 to 5 years 20 to 25 inspirations/min, 5 to 10 years 18 to 20 inspirations/min. It can also be called respiratory movements per minute (RMM); systolic blood pressure (SBP) is 120 mmHg and diastolic blood pressure (DBP) 80 to 75 in adults can be considered normal (normotensive), in children blood pressure varies depending on age group, pathologies, emotional condition weight, height and sex⁸.

| NORMAL BPM IN CHILDREN | | |
|--------------------------|------------|-----------|
| Age range | Systolic | Diastolic |
| At birth (<1kg) | 39 to 59 | 16 to 36 |
| At birth (3kg) | 50 to 70 | 25 to 45 |
| Neonate (96h) | 60 to 90 | 20 to 60 |
| Infant (6 months old) | 87 to 105 | 53 to 66 |
| Children (2 years old) | 95 to 105 | 53 to 66 |
| School age (7 years old) | 97 to 112 | 57 to 71 |
| Teenager (15 years old) | 112 to 128 | 66 to 80 |

Source: La Torre, Pechini. (2013, p. 199)⁹.

When the patient signs and symptoms such as nausea, vomiting, headache, amnesia, and nasal bleeding may indicate the occurrence of head trauma and central nervous system trauma, and in the event of a grave change that could compromise the patient's life, you must refer and/or accompany him to the nearest medical service¹⁰.

Before the oral clinical examination, a quick general examination of the child must be carried out, evaluating the facial structures, and observing asymmetries and displacements. Simple palpation examination, observation of the midline during opening and closing movements of the jaws may indicate damage to the temporomandibular joint (TMJ) region (e.g., midline deviation), especially in blows to the mentum region, when should refer the patient to oral and maxillofacial care¹⁰.

Of the complementary exams, the radiographic exam is, without a doubt, one of the most important, as, through its analysis, imperceptible changes can be visualized. In this way, it is possible to detect radicular fractures, the alveolar process, the extension of the coronary fractures and their proximity to the pulp tissue, pulpal exposure, the size of the pulp chamber, periapical radiolucencies, resorptions, the presence of bodies foreign materials, mainly in soft tissues, the degree of tooth displacement, the absence of periodontal ligament space in cases of intrusive dislocation or its increase in cases of extrusive luxation, as well as to verify the stage of root development (rhizogenesis) and, in special, for

trauma to deciduous teeth, degree of rhizolysis and formation of the permanent successor. Radiographic examination is also of fundamental importance in the periodic monitoring and control of traumatized teeth, as some changes in these teeth only appear after some time. Therefore, it is an important document for recording the case¹⁰.

The recommended radiographic technique is periapical using the parallelism method. The aim is to standardize the radiographic examination as much as possible so that it can be used in diagnosis and for comparison in future follow-up examinations. It must be remembered that the radiographic examination is a complementary examination and, as such, assists in the diagnosis; the professional must interpret it with clinical and anamnestic data to prepare the diagnosis and treatment plan¹⁰.

Some items may affect the choice of treatment, such as mastery of the technique and working conditions of the dentist, cooperation of the child, previous trauma or caries lesion damaging the pulp, habits and lack of hygiene affecting the periodontium, time elapsed, stage of development of the deciduous/permanent, occlusion, general health, parental cooperation in treatment and returns, among others¹⁰.

Trauma from injuries to the deciduous dentition is common, due to the resilient bone surrounding the deciduous teeth, injuries often include tooth luxation. The close proximity of the two dentitions poses a risk to the permanent dentition, in the sense that the force of a sharp



impact can easily be transmitted to the developing tooth germ. The infection subsequently develops in a deciduous tooth lesion and represents another threat to the development of permanent dentition. Therefore, the treatment strategy following an injury to the primary dentition is dictated by concern for the safety of the permanent dentition. To do this, the following needs must be observed: Make sure whether the displaced deciduous incisor has invaded the follicle of the developing tooth germ; if this occurs, the deciduous tooth must be removed; control healing in the traumatised area to prevent secondary damage to the developing permanent tooth¹¹.

Examining a child who has suffered some type of dental trauma is not an easy task, especially when the patient is in pain and the soft tissues adjacent to the traumatized area are lacerated, with bleeding and edema. The dentist must determine the extent of injuries resulting from trauma through correct diagnosis, carrying out immediate treatment and aiming for a more favorable prognosis¹⁰.

If the child has suffered an injury and contamination of the wound has occurred through contact with the soil, especially in rural areas, it should be checked whether the patient's tetanus vaccination is up to date. If the child is up to date on vaccinations, under normal circumstances, boosters are not necessary⁷.

Whenever you decide to have surgery, this decision must be communicated to the child's parents, giving them information about the work that will be done, explaining why and the possible complications. Parental authorization must be made in writing, and only after this step will surgery proceed. The basic principles that govern oral surgery in children are the same as those that

govern oral surgery in adults, namely: necessity and opportunity; asepsis and antisepsis; a traumatic surgical technique; and carried out with appropriate instruments¹².

IV. HOSPITAL CARE

Generally, outside the home, park, daycare/school, sports, among others, the paediatric orofacial trauma accidents can range from moderate to very serious cases. In many cases, the etiology is related to high impacts due to traffic accidents, in these cases, polytrauma can be observed, requiring specialised teams with anaesthetists, oromaxillocranial surgeons, paediatric dentists, traumatologists, among others.

Paediatric trauma is one of the most frequent causes of hospitalisation in the world and is among the three main causes of death during childhood and adolescence. Trauma in paediatrics should be suspected for all patients who present with hypotension, respiratory distress, altered consciousness (Glasgow < 13), two or more long bone fractures, penetrating injuries, burns, amputations or paralysis of any extremity. All polytraumatized paediatric patients should be considered a critically ill patient and their care should be prioritised for transfer to a hospital. 50% of paediatric polytrauma patients have a traumatic brain injury (TBI)¹³.

It is important that the professional team knows the different severity classification indices for paediatric patients, such as the Glasgow table adapted for paediatrics, Paediatric Trauma Index and Trauma Severity Indices, among others, so that they can make decisions appropriate to the severity of the case.

| PAEDIATRIC TRAUMA INDEX | | | |
|---------------------------------------|----------------------------------|-------------------------------------|----------------------|
| Classification | | | |
| COMPONENT | +2 | +1 | -1 |
| Weight | >20Kg | 10-20Kg | <10Kg |
| Airway | Normal | Sustainable | Unsustainable |
| SBP | 90mm Hg Palpable radial pulse | 90-50mmHg Palpable femoral pulse | <50mmHg Pulseless |
| CNS | Awake | Obtunded or unconscious | Coma or unconscious |
| Wound | No | Small | Large |
| Fracture | No | Closed | Open or multiple |
| Mark only one item for each component | | | |

Severity table example. Source: Billi, 2001¹⁴

Hospital care for trauma patients involves several steps that can directly influence the results of treatment for polytraumatized patients, determining rapid recovery or even death of the patient, if neglected. Therefore, it is of fundamental

importance that the entire team responsible for trauma care in a hospital environment, including the oral and maxillofacial surgeon, has extensive knowledge of the logistics that extend from the



patient's admission, evolution, and hospital discharge¹⁵.

Initial hospital care in complex cases must involve a head and neck surgeon, neurosurgeon, paediatric dentist, paediatrician, oral and maxillofacial surgeon, traumatologist, vascular surgeon and anaesthetist, among others. However, as soon as possible post-surgery, hospital, trauma, and neurophysiotherapy physiotherapists must begin the necessary therapies for recovery with the minimum possible sequelae¹.

When a patient with trauma and maxillofacial injuries arrives at a hospital emergency room, potentially life-threatening injuries must first be addressed. Today, most hospitals have traumatology teams with many specialists participating. Those who deal with trauma patients undergo special training and work in accordance with Advanced Trauma Life Support (ATLS) guidelines, the principle of which is to first treat the injuries that pose a risk to life, and the emergency treatment indicated for such situations should not wait for a definitive diagnosis. Firstly, the airways must be secured, with the introduction of ventilation via the nasopharyngeal or bronchopharyngeal route. Sometimes endotracheal intubation must be performed, or even surgical access to the trachea. Excessive bleeding must be contained, and evaluation of neurological and cervical spine injuries is important in the early phase. The patient must be stabilized, and vital signs, such as pulse and blood pressure, checked before all regions of the body are carefully evaluated¹⁶.

Pneumocephalus often occurs in these types of traumas and head and neck surgeons, paediatric dentists, paediatricians, and maxillofacial surgeons must be aware of this to request neurosurgeon intervention. It is worth mentioning that, in traumas, especially automobile, cycling, motorcycling and violence, many other areas besides the head and neck can be involved and all professionals must observe this¹.

When caring for a patient with a face severely affected and destroyed by trauma, it is necessary to recognize that the most sophisticated resources in the fields of diagnosis and therapeutic arsenal must be used to their fullest extent with common sense and good technique, but they may be ineffective in the search for a face identical to what the patient had¹⁷.

The patient who is a victim of facial trauma may present soft and/or hard tissue injuries. Therefore, an extraoral examination must be carried out, evaluating not only the facial bones, facial symmetry, but also the function of the cranial

nerves, eyeball, soft tissues, muscles, temporomandibular joint (TMJ), ganglion chains and major salivary glands.

The intraoral examination must be carried out in an orderly manner and with good lighting. Structures such as lips, mucous membranes, tongue, teeth, alveolar ridge, floor of the mouth, palate and oropharynx must be inspected and palpated to conclude the diagnosis¹⁵.

Clinical evaluation in children is complex, which makes diagnosis considerably difficult, and the support of complementary tests is essential. Conventional x-rays are insufficient for the study of facial fractures in children, as there are multiple factors that mask the visualization of the characteristics of the fracture, such as the presence of tooth germs included in the maxilla, poor development of the jaws and paranasal cavities, making computed axial tomography difficult and third-dimensional (3D) reconstructions of great relevance for diagnosis and treatment control¹⁸.

Maxillofacial trauma, when not associated with airway obstruction or significant bleeding, should only be treated after the patient has completely stabilized and when the life-threatening injuries are fully controlled. Definitive oral and maxillofacial treatment can be safely postponed without compromising the fine repair¹⁵.

The most common supporting bone traumas are: Comminuted fracture of the dental alveolus; crushing and compression of the alveolar cavity, generally found in cases of intrusive and lateral luxation; Fracture of the alveolar wall; fracture of the buccal or palatal/lingual alveolar wall. During palpation, tooth mobility and the location of the fractured bone are observed.; Fracture of the alveolar process: the fracture line runs from buccal to palatal/lingual and may or may not compromise the alveolar cavity. When the fracture is beyond the apex, it does not compromise the alveolar cavity, but normally the fracture involves the alveolar cavity and may be associated with root fracture. It is observed that when testing the mobility of one of the affected teeth, the adjacent one also moves; Fracture of the mandible or maxilla: often involves the alveolar process, but does not always compromise the alveolar cavity. These more complex cases should be referred to a specialist, a maxillofacial specialist. When the fracture line involves erupted teeth or germs, it can compromise them, leading to losses¹⁰.

In paediatric patients, the appropriate time to treat facial fractures is less than 4 days, with risks of altered bone healing, malpositioned bone calluses, and persistent functional impotence after this period. Some fractures deserve special



attention, such as those involving facial sutures, which, depending on the patient's age, must be treated early¹⁸.

A successful outcome is achieved through appropriate reductions and stabilisation of facial fractures. Inadequate reduction, displaced fixations and insufficient immobilization will result in changes in bone consolidation and deformities with consequent changes in growth, development and facial aesthetics. It is essential to prevent the consequences of facial trauma, which can occur in the short or long term. Postoperative control is mandatory and must be careful and prolonged over time, with multidisciplinary management being fundamental.¹⁸

The child in the PICU, if not sedated or comatose, may have some needs related to age group such as play, carry out school activities and do not miss ties with friends and relatives. An important factor is team communication with the patient and his family. Communication must be clear, appropriate to age and cultural characteristics without technical words and professional jargon is more appropriate to have better understanding of and encouraging feedback¹⁹.

The physiotherapy sector must be in harmony with all teams to make decisions about what was carried out on the patient, this is important, as in different situations surgeons, oral maxillofacials, traumatologists, head and neck, craniofacial, etc. They may have placed some type of plate and/or screws for rigid intraosseous fixation, Erich bar, steel wires, and/or alloy for maxillomandibular block and, the patient must maintain the fixed occlusion for a certain period, so during this time no procedure is recommended that causes any movement of the temporomandibular joint, however there is a need for procedures that avoid any atrophy of the facial muscles, especially those related to chewing, deglutition and speech¹.

When the patient is discharged, social workers must contact the family, checking whether they are able to receive the patient and whether they can help them comply with medical and dental recommendations. However, it is known that in some cases these patients may be indigent, and the intervention of social workers to shelter them, at least during postoperative recovery, is necessary¹.

V. MOST FREQUENT TREATMENTS

| TRAUMA | TREATMENT |
|--------------------------------|---|
| Avulsion of deciduous . | <ul style="list-style-type: none"> • A periapical (size 0 sensor/film, paralleling technique) or occlusal radiograph (size 2 sensor/film) is essential where the primary tooth is not brought into the clinic to ensure that the missing tooth has not been intruded • The radiograph will also provide a baseline for assessment of the developing permanent tooth and to determine whether it has been displaced • Avulsed primary teeth should not be replanted • Parent/patient education: - Exercise care when eating not to further traumatize the injured soft tissues; To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied topically twice a day for 1 week²⁰. <p>Depending on the time left for the permanent tooth to erupt, a space maintainer will be needed.</p> |
| Subluxation of deciduous teeth | <ul style="list-style-type: none"> • A periapical (size 0 sensor/ film, paralleling technique) or occlusal radiograph (size 2 sensor/film) should be taken at the time of initial presentation for diagnostic purposes and to establish a baseline • Normal to slightly widened periodontal ligament space will be visible • No treatment is needed. • Observation • Parent/patient education: Exercise care when eating not to further traumatize the injured teeth while encouraging a return to normal function as soon as possible; To encourage gingival healing. Parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied topically twice a day for 1 week²⁰. |
| Contusion | It is generally not accompanied by any dental involvement. Treatment is symptomatic. Check the background of the buccal or labial groove looking for possible deep wounds or disinsertions in the soft tissue ⁷ . |
| Alveolar Fracture | Treatment: replacement and semi-rigid contention for 8 weeks. |



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| | <ul style="list-style-type: none">• Follow-up• Clinical examination after 1 week and 4 weeks• Clinical, radiographic examination and removal of the contention 8 weeks• Clinical and radiographic examination after 4 and 12 months²¹. |
| Complex coronary fracture | <p>Fracture involving enamel, dentin and exposing the pulp - Treatment depends on the stage of root formation:</p> <ul style="list-style-type: none">• Incomplete root – pulpotomy with calcium hydroxide, definitive restoration of the tooth• Complete root – pulpectomy with calcium hydroxide and definitive restoration of the tooth• In cases of delayed treatment – pulpectomy and definitive tooth restoration <p>Follow-up: clinical and radiographic examination after 6-8 weeks and 12 months and then annually until eruption of the successor permanent tooth²¹.</p> |
| No complex coronary fracture | <ul style="list-style-type: none">• Fracture of enamel or enamel and dentin without involvement of the pulp tissue• Involving only enamel✓ No compromise to occlusion or aesthetics -> enamel smoothing and topical application of fluoride.✓ Compromise of occlusion and aesthetics -> tooth restoration• Involving enamel and dentin - tooth restoration• Prognosis depends on the impact on the pulp tissue and the extent and time of dentin exposure.• Follow-up: clinical examination after 3-4 weeks. In cases of extensive dentin exposure, perform a radiographic examination every 3 months²¹. |
| Mandible fracture | <p>Signs and symptoms: a) Immediate: Localised pain during palpation, chewing or swallowing, edema, paraesthesia, hypoesthesia, sensitivity, the patient reports a strange sensation when closing the mouth; difficulty chewing, malocclusion; bone mobility of the area, crepitus, asymmetry; trismus, bleeding gums, among others, may occur; b) Late: localised pain during chewing or swallowing, difficulty speaking (some cases), paraesthesia, mainly related to the lower lip and mental region, facial asymmetry, edema, hematoma in the region that does not regress in the correct time, malocclusion, bone mobility, trismus, among others, may occur.</p> <p>Procedures: If this occurs during a service, for example dental exodontia, complete the procedure carefully; panoramic radiography or computed tomography (depending on the fracture, it may be difficult to visualise, which is why computed tomography is recommended); The procedure depends on the type and complexity of the fracture, generally consisting of: assessing the type of anaesthesia that will be necessary. In the case of general anaesthesia, it must be in a hospital environment with the presence of an anaesthesiologist; hygienisation; if there are bone fragments and/or non-organic materials, remove them carefully; perform anatomical reduction, containment and open stabilisation through orthodontic ties and/or externally fixed acrylic plates, or other material that provides this effect; however, in some cases, there is a need for surgery to fix internal resorbable plates screws on each side of the fracture(s), in the case of children, this should be evaluated with caution, given the bone development stage. What establishes the procedure is the complexity and the region of the mandible affected; sutures of soft tissues if necessary; postoperative panoramic radiography.</p> <ul style="list-style-type: none">• Prophylactic antibiotic therapy which will depend on the type of fracture and the location where the procedure will take place; oral anti-inflammatory appropriate for the patient and procedure; analgesic; tetanus prophylaxis - Check the validity of the tetanus toxoid (TT) or diphtheria and tetanus (DT) vaccination, if expired, advise the patient for urgent revaccination. If due to a car accident, anti-tetanus serum (SAT) is prescribed; Instruct the patient on proper oral hygiene and intake of liquid and pasty foods; use of mouthwash; cold water bags are suggested to reduce edema; recommend appropriate physiotherapy; follow. |



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| | <p>NOTE 1: Always support the patient's mandible when performing extraction of lower teeth.</p> <p>NOTE 2: There are different types of fractures, therefore there will be different approaches required for each situation.</p> <p>NOTE 3: Mandibular condyle fractures are more complex, therefore, they require specific procedures</p> <p>NOTE 4: The more immediate the reduction and reconstruction (if applicable), there will be fewer complications.</p> <p>NOTE 5: After surgery, carry out an assessment of possible post-surgical risks (e.g. osteomyelitis, pseudarthrosis, etc.) and, if necessary, carry out preventive procedures⁸.</p> |
| Mandibular condyle fracture | <p>Adequate treatment of condyle fractures depends on the patient's age, the complexity of the fracture in relation to its level (intracapsular vs. extracapsular) and the degree of displacement, the state of the dentition and dental occlusion, as well as the surgeon's experience²². The main objectives in treating facial fractures in paediatric patients are to restore functionality and provide bone union while preserving facial growth potential²³. Open treatment is indicated for displacement of the condyle into the cranial fossa, significant medial displacement that impairs mandibular movement, absence of contact between the fragments, in cases of multiple fractures of the middle third in which the mandible will serve as a guide for reduction and fixation of the others fractures²⁴. When possible, a non-surgical approach should be indicated, however in cases that require surgical reduction and internal fixation, this treatment should be carried out using a less traumatic surgical technique. Long-term follow-up is recommended for adequate assessment of the functionality and final aesthetics achieved²³. Marcolino, Gomes, Silva recommends for children > 5 years old / Patient and cooperating parents.</p> <p>CLINICAL TIMES: Diagnosis; Arthrocentesis; Manual handling of fractured stumps; Molding of dental arches; Recording of maximal habitual intercuspation (MHI) on wax 7; Installation of a Bimler device; Functional physiotherapy, ROBADADO technique, for 6 months; Weekly follow-ups; Removal of the Bimler orthopedic device at 6 months; Clinical follow-up for 24 months²⁵. When surgery is necessary, the use of absorbable fixation material is indicated as it does not require exposing the child to a second surgery.</p> |
| Nasal pyramid fractures | <p>Fracture reduction is performed with Asch forceps in older children, introduced into the nostril ipsilateral to the displaced nasal septum, promoting its alignment. Children between 1 and 8 years old have a small nasal pyramid, use Kelly forceps protected by gauze. Nasal packing is used when necessary to maintain the structure or contain bleeding. External containment is performed using plaster or plastic material. Haematomas of the nasal septum are treated with needle drainage or a vertical incision retrocolumellar and nasal packing with gauze or plastic splint, to avoid necrosis of the septal cartilage and its sequelae. In older children, digital reduction is performed with the little finger, accompanied by the anatomical reposition of the pyramid structures.</p> |
| Enamel fracture | <p>Types of intervention:</p> <ul style="list-style-type: none">- Carry out controlled wear of the fractured enamel edges, thus eliminating sharp edges and giving the tooth a more aesthetic shape. The wear must be done with abrasive discs, using water spray at the same time, ensuring the wear and aesthetics of the teeth. After this procedure, fluoride is applied. This wear is generally carried out in small losses or when there is a fracture in the horizontal direction. When this maneuver is performed, the tooth may have its incisive edge above the occlusion line. This situation is normalised because, as the patient is young and growing, passive eruption of this tooth will occur, and in adjacent teeth there will be wear of the incisor lobes, favouring the alignment of the incisive edges.- When there are no aesthetic conditions for wear, restore the tooth through acid etching of the enamel and composite resin. This procedure can be carried out |



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| | <p>during the patient's first consultation, as, due to the orientation of the enamel prisms, the fracture generally occurs in a bevel shape, requiring few mechanical maneuvers, such as wear or beveling, eliminating the possibility of combined stimuli¹⁰.</p> |
| Laceration | <ul style="list-style-type: none">- Often a laceration that affects the entire thickness of the inferior labium may not be detected due to the natural contour of the soft tissues or when an examination is attempted in a non-cooperative child. If there is a tooth fracture, always look for remaining teeth on the labium.- It is necessary to carefully suture skin injuries to avoid scarring, and only by an experienced person. Skin wounds should be closed within the first 24 hours and preferably within six hours of the accident.- All debris, such as sand and earth, must be removed using a brush soaked in an antiseptic solution such as 2.5% povidone-iodine or 0.5% chlorhexidine acetate.- It is important to remove the cutaneous skin edges with a scalpel to eliminate necrotic remains and irregular margins.- To unite muscle tissues and suture deep areas, the use of a thin resorbable material, such as polyglactin or polyglycolic acid, is recommended.- The final skin suture is performed with 6-0 nylon suture on a cutting needle⁷. |
| Intrusive luxation of deciduous teeth | <ul style="list-style-type: none">• A periapical (size 0 sensor/ film, paralleling technique) or occlusal radiograph (size 2 sensor/film) should be taken at the time of initial presentation for diagnostic purposes and to establish a baseline• When the apex is displaced toward or through the labial bone plate, the apical tip can be seen, and the image of the tooth will appear shorter (foreshortened) than the contralateral tooth. When the apex is displaced toward the permanent tooth germ, the apical tip cannot be visualized, and the image of the tooth will appear elongate baseline• When the apex is displaced toward the permanent tooth germ, the apical tip cannot be visualised, and the image of tooth will appear shorter (foreshortened) than the contralateral tooth• When the apex is displaced toward the permanent tooth germ, the apical tip cannot be visualised, and the image of the tooth will appear elongate.• The tooth should be allowed to spontaneously reposition itself, irrespective of the direction of displacement• Spontaneous improvement in the position of the intruded tooth usually occurs within 6 months.• In some cases, it can take up to 1 year• A rapid referral (within a couple of days) to a child-oriented team that has experience and expertise in the management of paediatric dental injuries should be arranged• Parent/patient education: Exercise care when eating not to further traumatize the injured soft tissues; to encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouth rinse applied topically twice a day for 1 week²⁰. |
| Lateral luxation and extrusive | <p>Teeth can suffer luxation can in any direction and, depending on the extent of the luxation, may require repositioning and retention. This can be accomplished with digital pressure or forceps. In the case of forceps, care must be taken to avoid damage to the root surface, in addition to holding the tooth only by the crown. The teeth will be visibly displaced, with possible mobility and with radiographic changes in the periodontal ligament. Initially, pulp sensitivity tests may present negative results.</p> <p>Conduct:</p> <ol style="list-style-type: none">1. Repositioning with local anaesthesia. It is important to perform repositioning as quickly as possible, as it is often extremely difficult to mobilize the tooth in a patient after 24 hours.2. Suture gingival lacerations. |



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| | <p>3. Use flexible containment with composite resin and wire or orthodontic appliances, for two weeks for extrusive luxation and four weeks for lateral luxation, due to concomitant fracture of the alveolar bone.</p> <p>4. Antibiotics, tetanus vaccine and mouthwash with 0.2% chlorhexidine gluconate if necessary.</p> <p>Lateral luxation have a dentoalveolar fracture component and it is important to mold the bone back into its correct position⁷.</p> |
| Facial trauma | <p>There are two types of treatments for facial trauma in children, orthopedic and surgical. The first is used in the management of condylar fractures to recover mandibular function, and fixed appliances or wires are used in association with functional therapy with the elastics¹⁸.</p> |
| Enamel crack | <p>Encourage the ionic exchanges that exist between the enamel and saliva, in order to obliterate the crack with calcium phosphate salts. Topical application of fluoride, tooth brushing using fluoride toothpastes or mouthwashes with fluoridated solutions, and in case of sensitivity, surface sealant can be used. Cracks often go unnoticed during routine examination, but on a more detailed examination, with the aid of transillumination or, depending on the incidence of the reflector's light beams, they can be detected¹⁰.</p> |
| Root fracture of deciduous teeth | <ul style="list-style-type: none">• A periapical (size 0 sensor/film, paralleling technique) or occlusal radiograph (size 2 sensor/film) should be taken at the time of initial presentation for diagnostic purposes and to establish a baseline• The fracture is usually located mid-root or in the apical third• If the coronal fragment is not displaced, no treatment is required• If the coronal fragment is displaced and is not excessively mobile, leave the coronal fragment to spontaneously reposition even if there is some occlusal interference• If the coronal fragment is displaced, excessively mobile and interfering with occlusion, two options are available, both of which require local anaesthesia• Option A: Extract only the loose coronal fragment. The apical fragment should be left in place to be resorbed.• Option B: Gently reposition the loose coronal fragment. If the fragment is unstable in its new position, stabilise the fragment with a flexible splint attached to the adjacent uninjured teeth. Leave the splint in place for 4 weeks.• The treatment depends on the child's maturity and ability to tolerate the procedure. Therefore, discuss treatment options with the parents. Each option is invasive and has the potential to cause long-term dental anxiety. Treatment is best performed by a child-oriented team with experience and expertise in the management of paediatric dental injuries. Often no treatment may be the most appropriate option in the emergency scenario, but only when there is the potential for rapid referral (within several days) to the child-oriented team.• Parent/patient education: Exercise care when eating not to further traumatise the injured tooth while encouraging a return to normal function as soon as possible; To encourage gingival healing and prevent plaque accumulation, parents should clean the affected area with a soft brush or cotton swab combined with an alcohol-free 0.1%-0.2% chlorhexidine gluconate mouthrinse applied topically twice a day for 1 week²⁰. |

VI. CONCLUSION

There are different types of oral and maxillofacial trauma that can occur in childhood, presenting varying degrees of complexity, some of which can be simpler and can be treated in a doctor's office or outpatient clinic, but there are some that can only be treated in specialized hospitals, requiring multidisciplinary teams. The paediatric dentist must know how to recognise

these different types of traumas to resolve them or refer the patient to teams specialized in the case.

Oral and maxillofacial trauma can cause psychological trauma, both in the patient and in the parents, who start to overprotect their children, and this needs to be worked on by the paediatric dentist, both in preventive matters and with the least traumatic treatments possible and with humanizing attitudes. Another consequence of most trauma is



of aesthetic nature, for example, scars, changes in function in many cases, changes in the appearance and colour of the teeth involved, among others, which may or may not be changed by the dentist, depending on the case.

Encouragement and guidance is needed for the use of Personal Protective Equipment – PPE, such as mouthguards, face shields, helmets, among others, in sporting or leisure activities where trauma may occur; training for teachers, parents and babysitters to know what to do in the first moment of a trauma so that complications do not occur; toys and parks that guarantee the safety of children when playing, respect for traffic laws by drivers; child safety campaigns, among others, to reduce the rates of childhood trauma.

Health sciences are dynamic, the subjects covered here are always undergoing updates, and the reader must always be updated on new techniques and technologies related to the subject to provide efficient, effective and humanising care to the patient.

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