



Legal Medicine Course 3

Traumatic odontostomatological forensic pathology



BMF injuries



Classification

- soft tissue injuries
 - facial - see C2
 - labial
 - intraoral
- hard tissue injuries
 - DENTAL
 - BONE



Labial lesions

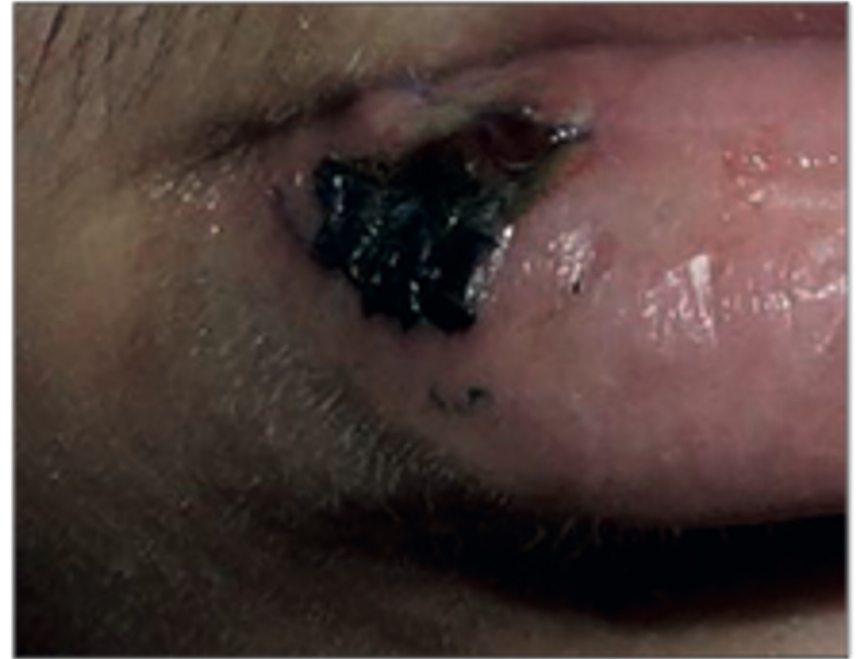
- external - red lips
- internal - buccal vestibular mucosa

Types:

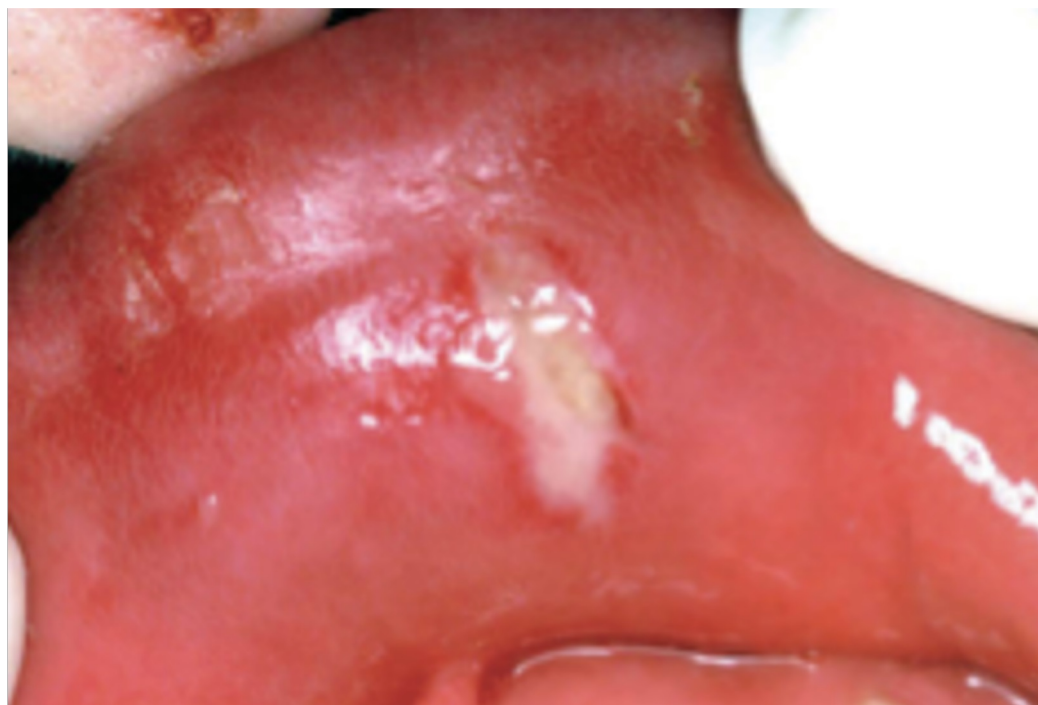
- hematomas (bruises)
- excoriations
- wounds
 - superficial
 - deep
 - transfixing



Bruising, recent



Laceration, 3d, DV





Boy, 11 years old, lateral dislocation of the right upper central incisor and subluxation of the ipsilateral lateral incisor, after a punch. The patient presents with gingival edema, sulcus hemorrhage, and signs of periodontal ligament and alveolar bone injury, hematoma of the upper labial mucosa



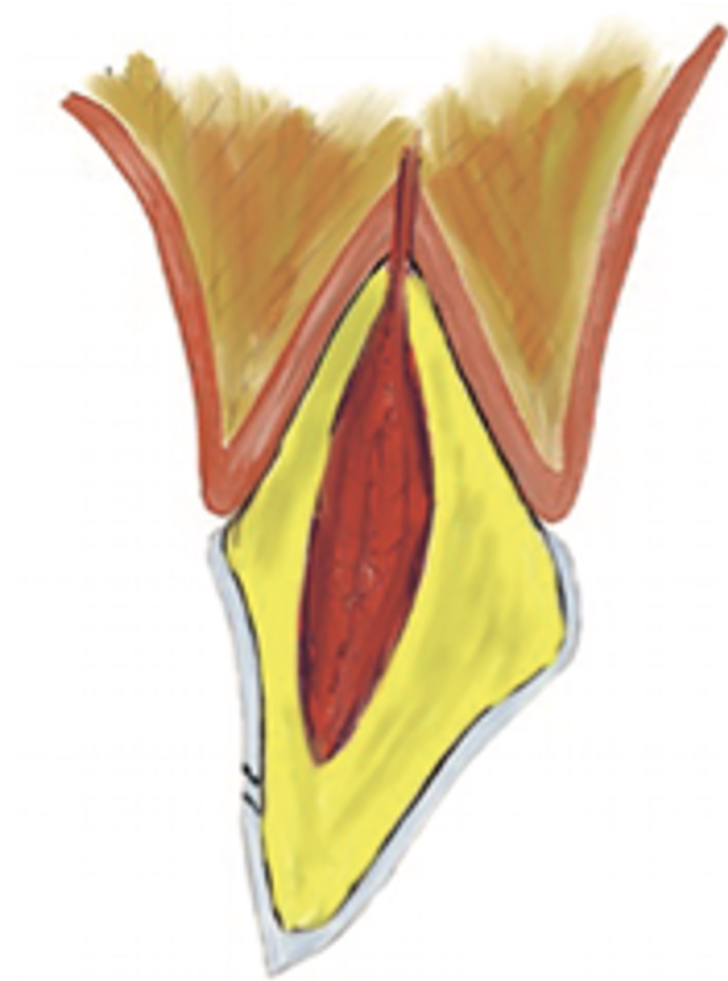


Dental trauma

- dental fissures
- dental fractures
- tooth dislocations
- prosthetic works (?)

Fissure

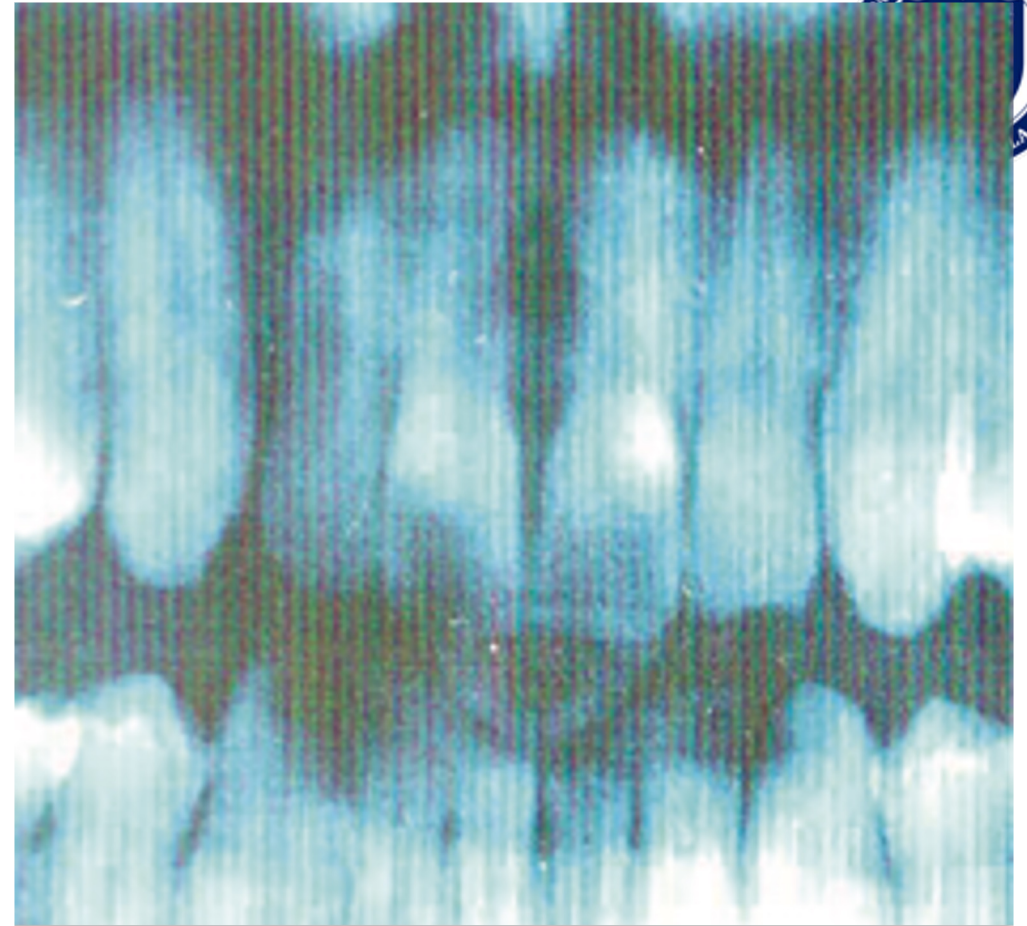
- fracture line that does not extend beyond the enamel
- direct impact with a hard body
- usual location - labial, incisors
- Views
 - difficult in direct light
 - easy in indirect light, perpendicular to the long axis of the tooth
- 3-5ZIM



Coronal fractures

- uncomplicated
 - affect the enamel and dentin
 - associated with loss of dental tissue
 - often horizontal, mesial or distal
 - frequently upper incisors
 - normal mobility
- complicated
 - expose the dental pulp => hemorrhage or pulp polyp (if treatment is delayed)
 - pain with thermal changes, not with percussion
- 9-10 ZIM (12-15, for >3 affected teeth)





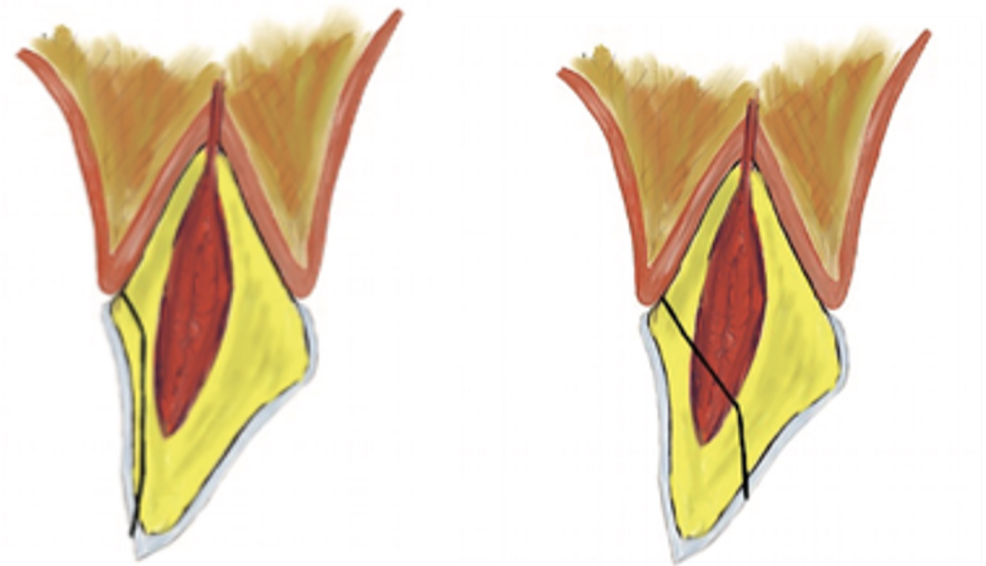
Crown-root fractures

- uncomplicated

- involve enamel, dentin and cementum
- mechanisms:
 - direct (heteroaggression, AR) => previously located
 - indirect (heteroaggression) => posteriorly located (PM.M)
- the fracture line usually starts a few mm incisally from the gingival margin, with a proximal direction
- minimal movement of fragments (held in place by periodontal ligament/dental pulp)
- clinical: mobility, sensitivity to percussion)
- 9-12 ZIM (12-15, for >3 affected teeth)

- complicated

- involve enamel, dentin, cementum and dental pulp
- positive percussion test
- crown fragment - mobile
- 11-12ZIM (14-15, for >3 affected teeth)



Root fractures

- involve the cementum and dental pulp
- coronal fragment - can be mobile and displaced
- clinical: sensitivity to percussion, bleeding in the gingival sulcus
- sensitivity: can be negative (nerve damage)
- tooth - changes color to red or gray (temporarily)
- 9-12 ZIM (max 18 for multiple root fractures)





Dental dislocations

Dental contusion

- damage to the support structure
- without abnormal mobility
- without dental movement
- significant reaction to vertical or horizontal percussion
- + response to sensitivity tests
- 3 ZIM

Dental subluxation

- damage to the support structure
- with abnormal horizontal mobility
- without moving
- sensitivity to percussion and occlusal forces
- bleeding in the gingival sulcus
- + response to sensitivity tests
- minimal increase in radiological periodontal ligament space
- 5-7 ZIM

Extrusive dislocation

- partial displacement outside the dental alveolus
- tooth - elongated, mobility ++
- hemorrhage in the alveolar sulcus and periodontal ligament
- lingual deviation of the crown
- dull sound on percussion
- X-ray - increased periodontal space in the apical direction
- 20-25 ZIM



Lateral dislocation

- tooth displacement in a direction other than axial
- usually - the displacement is lingual
- frequently associated with fracture of the vestibular part of the alveolar ridge
- 20-30 ZIM



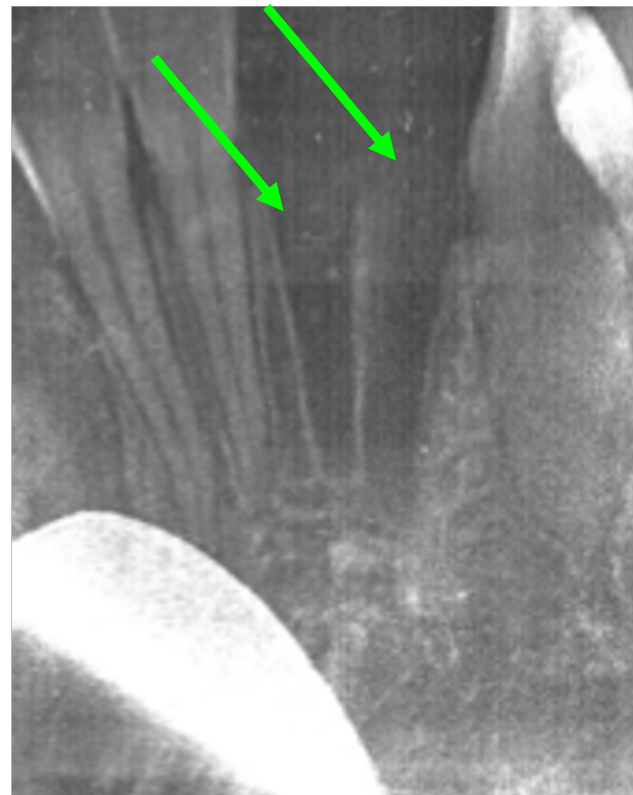
Intrusive dislocation

- axial movement of the tooth towards the dental alveolus
- associated fracture (often comminuted) of the alveolar bone
- ++ complications
- dg diff with avulsion - Rx
- are not sensitive to percussion
- metallic noise on percussion
- fixation in the dental alveolus
- 25-30 ZIM



Tooth avulsion

- complete tooth dislocation
- most common - upper central incisors, 7-9 years (periodontal ligament laxity + reduced mineralization of perialveolar bone tissue)
- 10-14 ZIM (20-25 with implant)



Alveolar ridge fracture

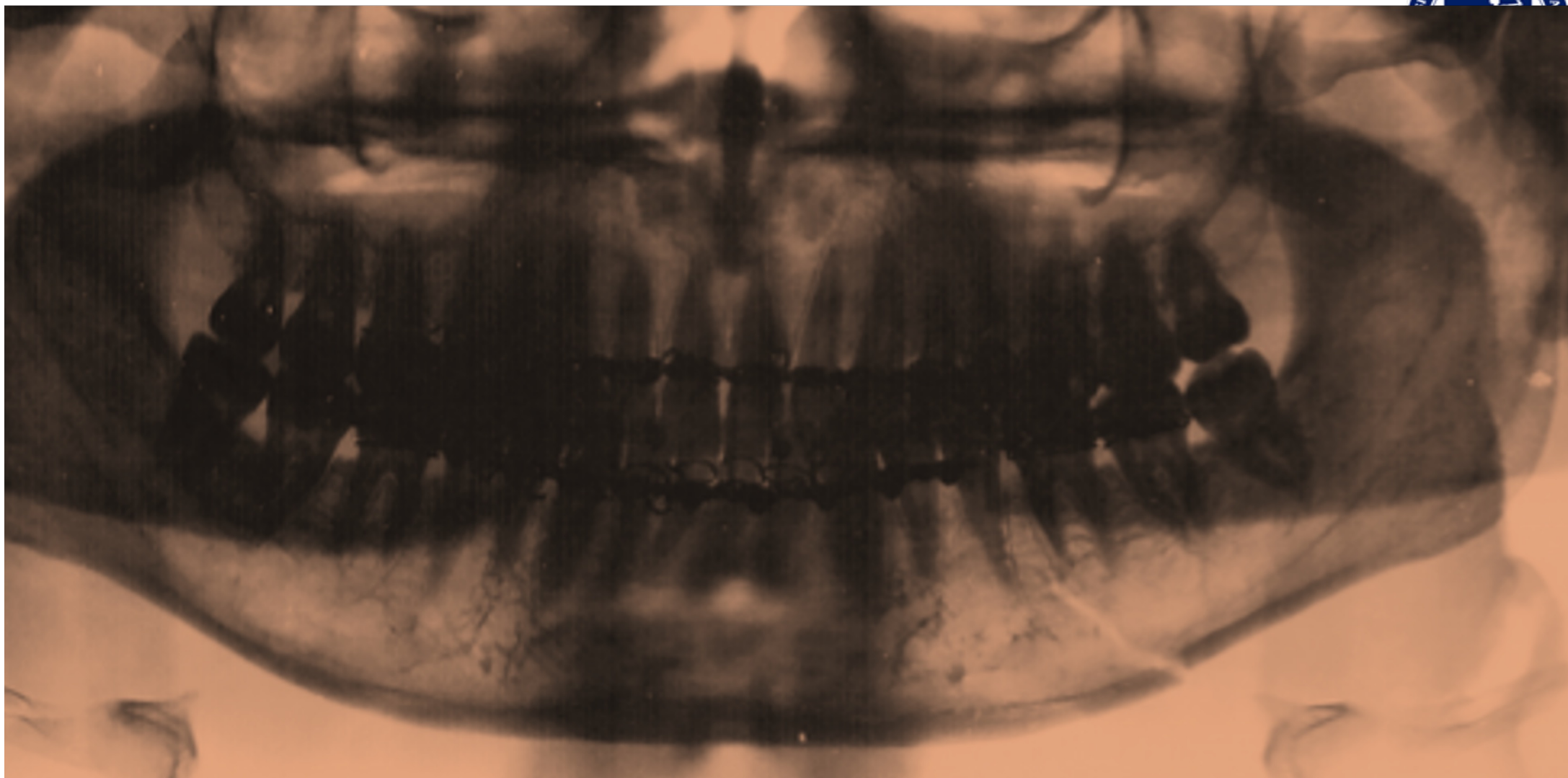
- direct trauma (heteroaggression, AR - impact with the blade)
- post-extraction accidents
- usually - anterior jaws
- types:
 - alveolar wall (unilateral)
 - comminution of the dental alveolus
 - associated with alveolar process fractures
- 20-25ZIM (alveolar margin), 25-30 ZIM - alveolar process
- disability - multiple tooth loss, associated with the impossibility of fixed prosthetics





Mandibular fractures

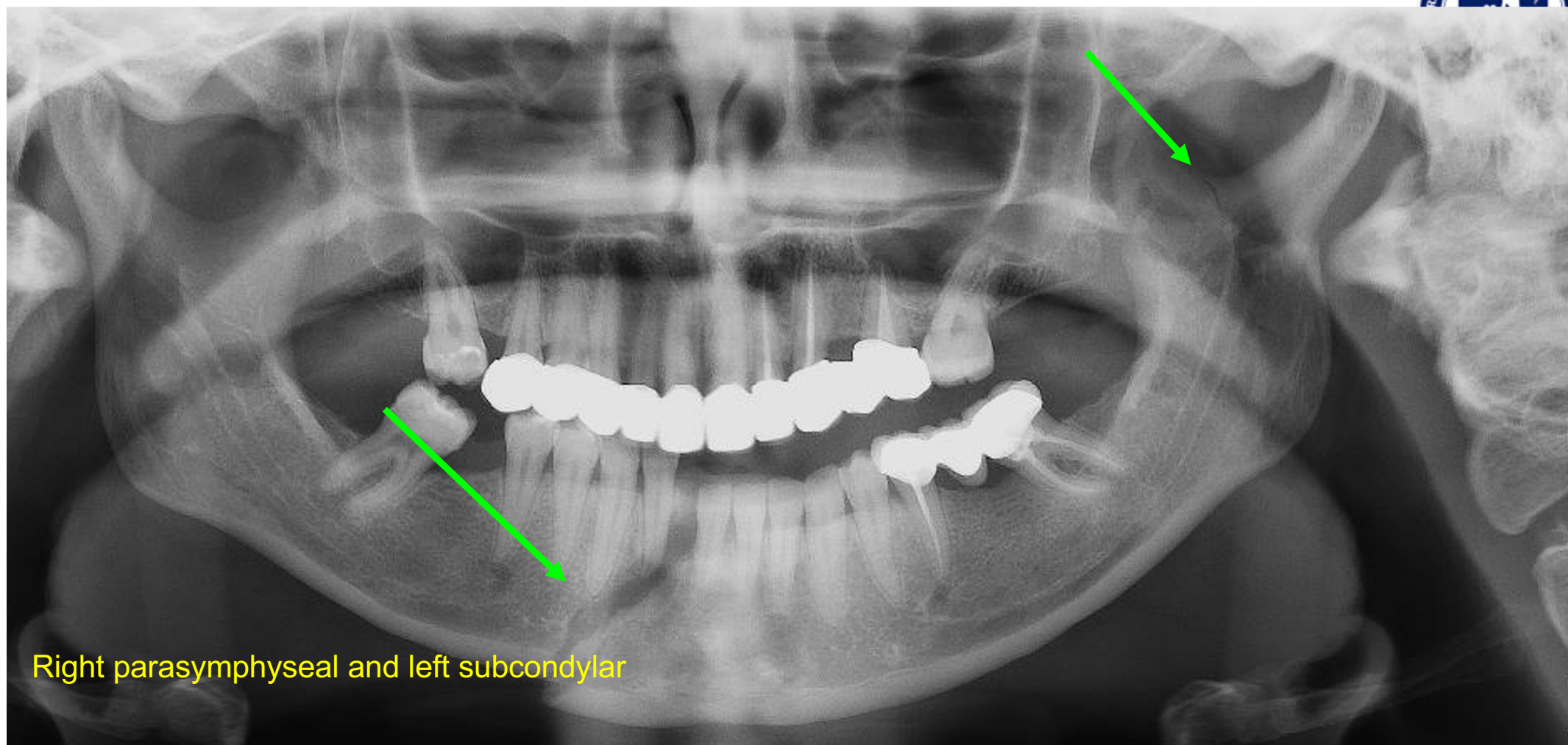
- cracks
 - 10-15 ZIM
- symphysis
 - minimum displacement
 - occlusion in accordion
 - approaching the fragment to the mouth opening
 - fragment separation when closing the mouth
 - 30-35 ZIM
- parasymphysis
 - increased instability
 - bilateral - lingual ptosis towards the pharynx - risk of affixation
 - 35-50 ZIM
- side
 - 35-40 ZIM
- angle
 - increased frequency (low resistance due to the presence of the wisdom tooth if impacted)
 - mechanism
 - indirect – hit in the chin
 - direct - boxing
 - 35-40 ZIM
- branch
 - rarely
 - minimal movement (intense muscle padding)





Mandibular fractures

- condylar
 - of the condylar head:
 - intraarticular
 - indirect mechanism - compression by vertical impact at the angle of the mandible or at the chin level
 - increased risk of ear canal injuries - otorrhea
 - late - arthrosis or temporomandibular ankylosis
 - 20-25 ZIM
 - high condylar (anatomical neck)
 - indirect mechanism - blow to the chin or mandibular angle
 - important trip with:
 - apparent shortening of the mandibular ramus
 - premature contact of the molars on the affected side
 - 20-25 ZIM
- subcondylar (basicondylar)
 - oblique path between the sigmoid notch and the posterior edge of the mandible
 - movements - limited by the muscle strap
 - mechanism - indirect
 - 20-25 ZIM
- coronoid
 - direct, lateral trauma
 - associated with zygomatic arch fracture (if the mouth was closed during the hit) or protrusion (open mouth)
 - 35-40 ZIM
- comminuted
 - can exceed 100 ZIM



Right parasymphyseal and left subcondylar



Consequences that can be included in 194 Art. of the CC

S&P Disability:

- horizontal ramus pseudarthrosis, with loss of masticatory function
- vicious consolidations, with severe occlusion impairment and impossibility of prosthetics
- total mandibular constriction (only allows ingestion of liquids and semi-liquids)

Life endangerment:

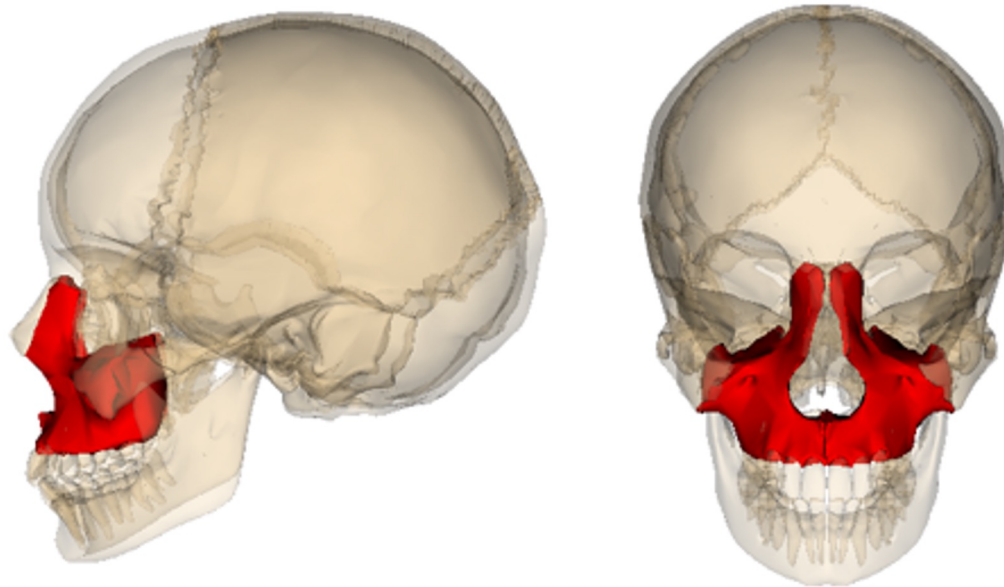
- posterior migration of the chin in double/multiple fractures with mechanical asphyxia
- severe acute hemorrhage (rupture of large branches of the carotid artery, facial artery)
- cerebral or extracerebral septic complications

S&P EP:

- complex mandible fractures
- loss of important bone fragments
- significant lesions of the masticatory muscles with significant facial deformity

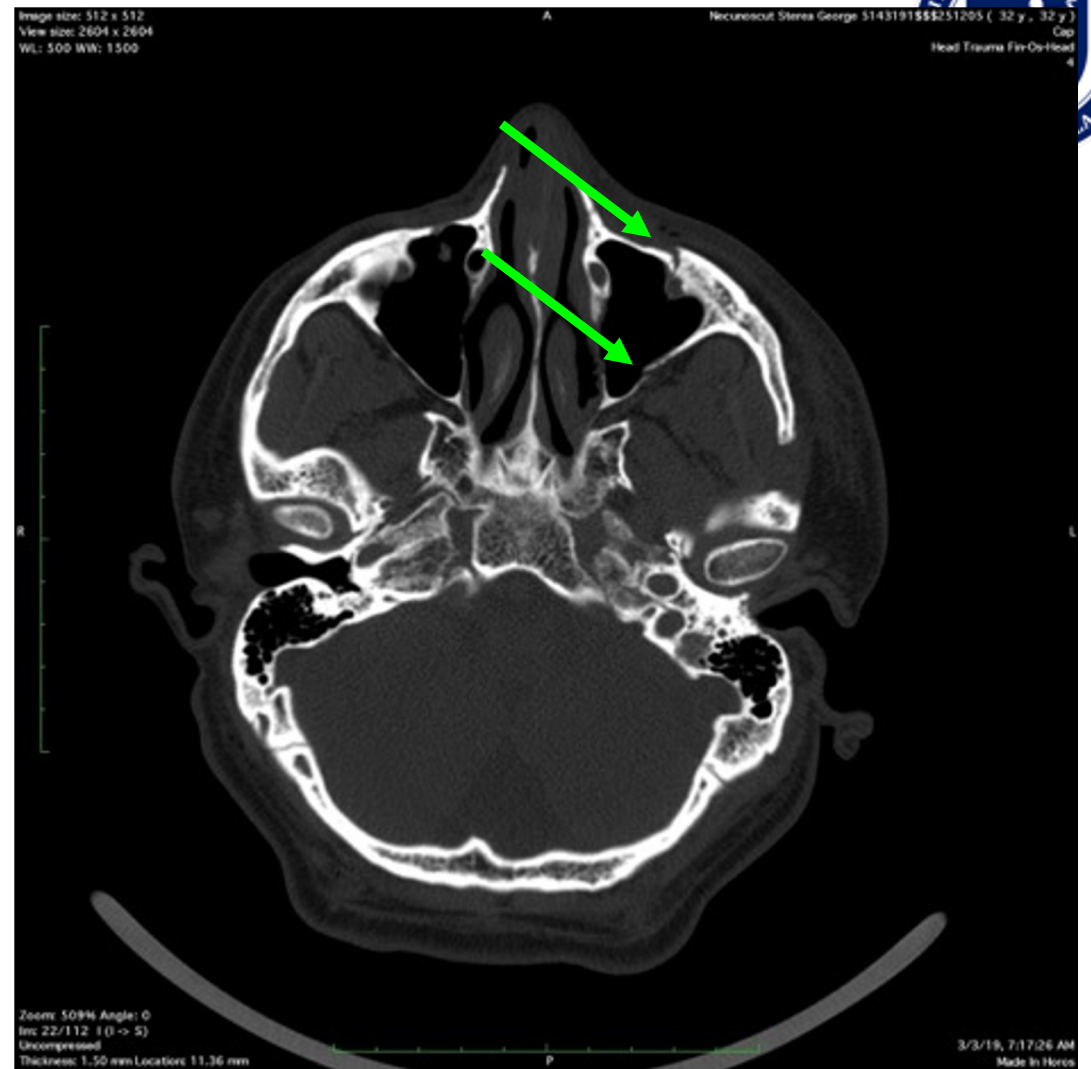
Fractures of the facial bone

- includes the maxillary bone, zygomatic, lacrimal, palatine bones, vomer, ethmoid, sphenoid, nasal bones proper, pterygoid processes, inferior nasal turbinates
- delimited by a series of anatomical cavities: orbits, frontal sinuses, ethmoid, sphenoid, maxillary, nasal fossae)



features

- unlike the mandible, where most displacements are secondary, here they are primary
- rapid bone healing (thin cortex, rich vessel supply)
- frequently comminuted, with displacements/blockages
- reduction + immobilization - difficult
- number of ZIMs - highly variable
- severity depends primarily on adjacent soft tissue injuries
- LE - frequent

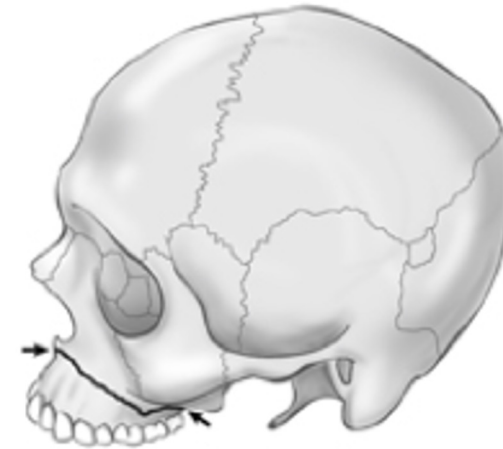
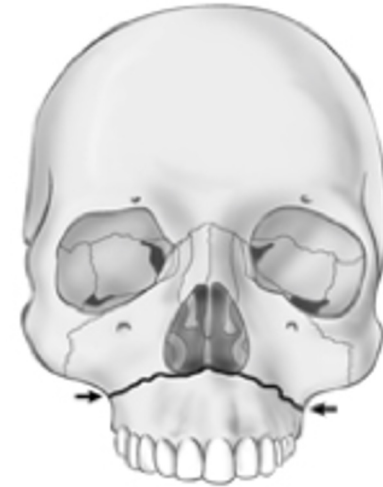


The Fort 1

- horizontal, transmaxillary path, through the inferior nasal aperture, nasal septum, lateral piriform ridge, upper dental arch, runs inferior to the zygomaticomaxillary suture and then through the pterygomaxillary junction

Mechanism:

- direct frontal impact to the lower portion of the facial massif
- indirectly through the impact of the mandible on the maxilla.



Le Fort 2 (low craniomaxillary disjunction)

- nasoethmoidal/subzygomatic tract, bilateral from the root of the nose, inferior to the frontonasal suture -> frontal processes of the maxilla, lacrimal bone, orbital floor, infraorbital margin, anterior wall of the maxillary sinus, zygomatic, pterygopalatine fissure and pterygoid plates

Mechanism:

- Direct hit, root of the nose
- Direct blow, middle floor of the face

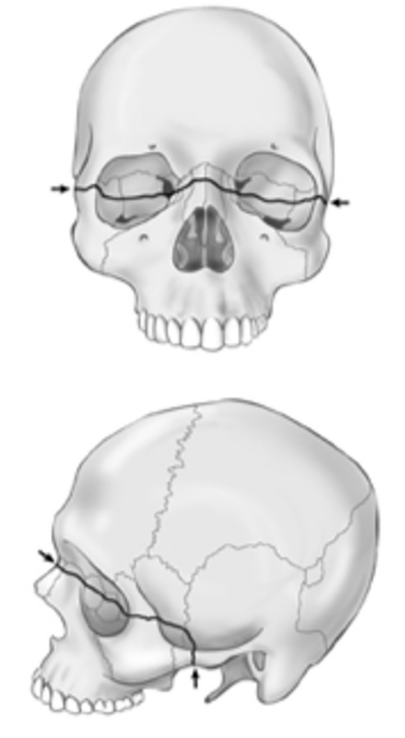


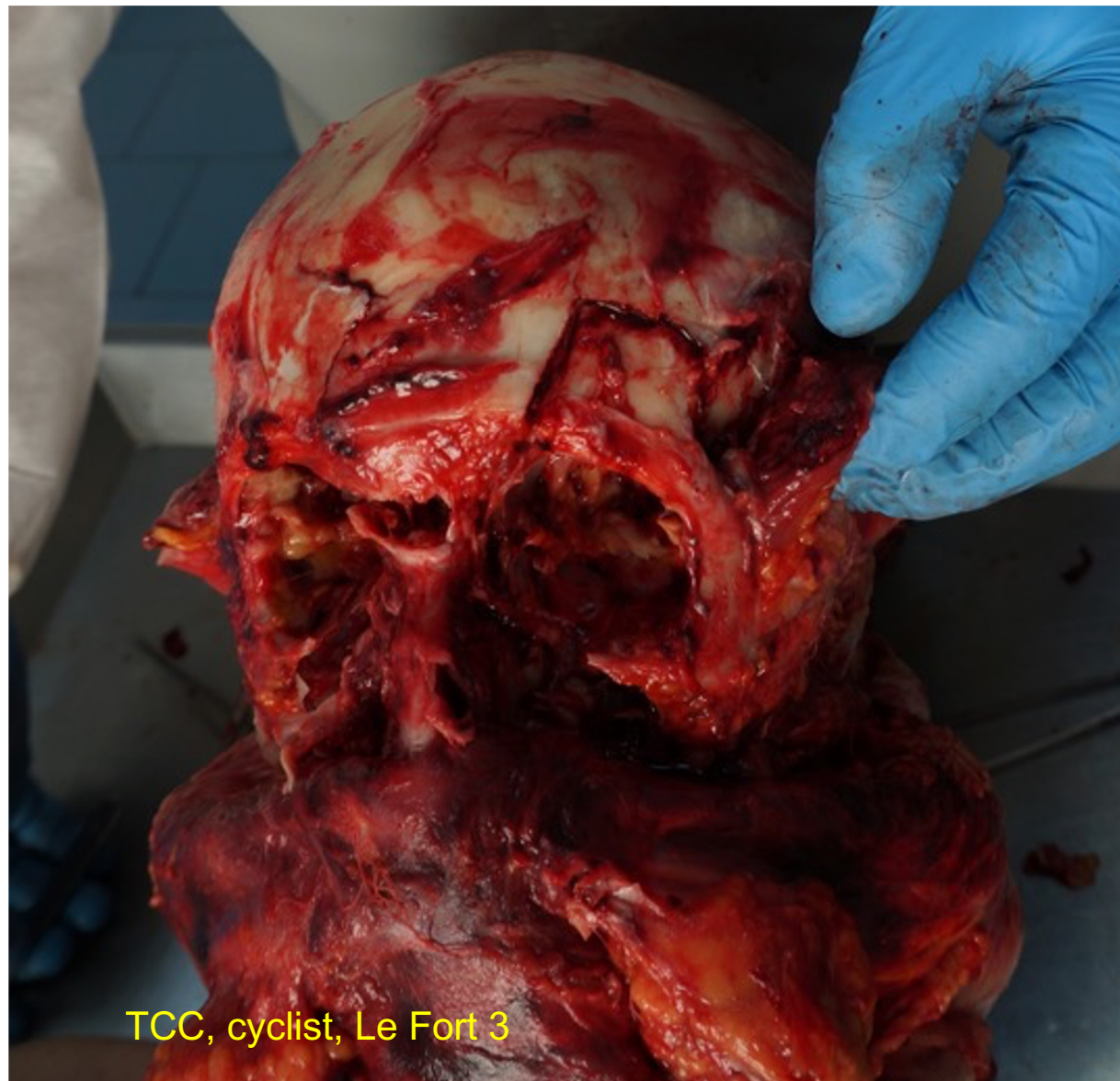
Le Fort 3 (high craniofacial disjunction)

- craniomaxillary separation at the level of the fronto-zygomatic and nasofrontal sutures, the route passing through the nasofrontal or nasomaxillary suture, medial wall of the orbit, naso-lacrimal groove, ethmoid, orbital floor, inferior orbital fissure, lateral orbital wall, zygomatico-frontal suture, zygomatic arch; nasally, the fracture line passes through the perpendicular blade of the ethmoid, vomer, pterygoid plates and base of the sphenoid

Mechanism:

- Direct – hit to the glabella or zygomatic bone







Consequences Art 193, 194 CC

S&P Disability

- loss of bone substance in the palatine arch, incisor bone (communications with the nasal cavities or maxillary sinuses appear), regardless of prosthetics
- post-traumatic loss of alveolar processes, with oral-sinus communication:
- significant impairment of mastication
- visual impairment (diplopia, orbital apex syndrome, sphenoidal cleft syndrome)
- severe, unprotectable occlusal damage
- association of orbital lesions with paralysis, severe hemorrhages, posterior retinal detachment, n II lesions, blindness

S&P EP

- vicious, irreparable consolidations even
- flattening + widening of the transverse diameter of the face and the intercanthal distance;
- significant loss of bone substance;

LE :

- acute posthemorrhagic anemia (maxillary, pterygopalatine, etc.)
- cavernous sinus thrombosis through carotid-cavernous sinus fistulas (fr. le Fort)
- intra or extracerebral septic processes

ZIM:

- 15-20 - simple fractures, without significant comminution
- le Fort 1,2 - 35-45 ZIM, le Fort 3 - 40-50 ZIM
- complex comminuted wounds open to the skin - about 70 ZIM; open in anatomical cavities: 50-60 ZIM
- frequent supplementation due to the need for re-interventions

Other fractures

- **NASAL**
 - increased frequency
 - usually by active mechanism (young people)
 - indirect mechanism - elderly (low elasticity)
 - AR - association with other fractures
 - children - in green wood
 - elderly - comminuted, with clogging
- **nasoorbitoethmoidal**
 - associated with high kinetic trauma (motorcycle accidents, falls)
 - direct - hard bodies of increased size with increased E_c (neighboring bone reliefs must first be fractured)
 - indirect - transmission of forces through low-resistance structures (lateral orbital fracture, with energy transmitted through the eyeball)
 - indirect - displacement of adjacent fragments, with focal increase in parietal tension and appearance of new NOE fracture lines



NOE, motorcycle accident, recovery at 12 L

Source:

<https://www.ncbi.nlm.nih.gov/books/NBK557468/>, CC4 License



Domestic violence



Any intentional action or inaction, other than actions of self-defense or defence, manifested physically or verbally, committed by a family member against another member of the same family, which causes or is likely to cause physical, mental, sexual, emotional or psychological harm or suffering, including the threat of such acts, coercion or arbitrary deprivation of liberty

Aggressors can be:

- kin
- other people with whom family-like relationships have been established



Types

- verbal
- psychological
- physical - bodily harm or injury to health by hitting, pushing, slamming, pulling hair, stabbing, cutting, burning, strangling, biting, in any form and of any intensity, including disguised as the result of accidents, by poisoning, intoxication, as well as other actions with a similar effect, submission to exhausting physical efforts or to activities with a high degree of risk to life or health and bodily integrity
- sexual
- economic
- social
- religious



Behavioral aspects associated with DV

- accusation of chronic pain, frequent visits to the doctor;
- low self-esteem;
- experiencing episodes of violence during childhood;
- emotional dependence on the abusive partner;
- the needs of the aggressor partner above one's own needs;
- taking responsibility for the conduct of the aggressor partner;
- use of tranquilizers and/or alcohol abuse;
- the existence of suicidal ideas or acts;
- presence of sleep disorders: insomnia, violent nightmares;
- severe agitation, anxiety, permanent nervousness;
- confused thinking, inability to make decisions, lack of concentration;
- rigid views on the roles of women and men



Injury characteristics

- craniofacial injuries
- compression mechanism - cervical, limbs
- defense injuries
- different ages
- inconsistency between appearance and declared mechanisms
- sexual assaults frequently unreported

Husband









Child abuse



Definition

any form of ill-treatment by parents or any other person in a position of responsibility, power or trust with the child, which causes actual or potential harm to the child's health and endangers his life, development, dignity and morality

TYPES

- **Abuse**
- **Neglect**
- **Exploitation** - a person, usually an adult, obtains sexual gratification, financial gain or advancement by abusing/exploiting the sexuality of a child, violating their rights to dignity, equality, autonomy and physical and mental well-being; examples: prostitution, sex tourism, marriage trafficking (including mail order), pornography, striptease
- **Child trafficking** - the recruitment, transportation, transfer, harboring or receipt of a minor for the purpose of exploitation.
- **Specific types**

Child abuse



Definition

any voluntary action of a person who is in a relationship of responsibility, trust or authority towards him, through which life, physical, mental, spiritual, moral or social development, bodily integrity, physical or mental health is endangered

Shapes:

- physical
- psychological
- sexual
- emotional



Negligence

Definition

the omission, voluntary or involuntary, of a person who has responsibility for the upbringing, care or education of a child to take any measure subordinate to this responsibility, which endangers the life, physical, mental, spiritual, moral or social development, bodily integrity, physical or mental health of the child

Shapes :

- food
- clothing
- of hygiene
- EDUCATION
- emotional
- child abandonment/family abandonment



Particular forms

- A. Non-accidental poisoning of the child - forced to drink alcohol, swallow tranquilizers
- B. Shaken baby syndrome
- C. Munchausen syndrome by transference - artificial creation by the parent of an illness in the child (administering medications, identifying absent symptoms)
- D. Stockholm Syndrome - the child expresses adulation and other positive feelings towards the aggressor parents
- E. Violence via the internet/mobile phone:
 - 1. illegal/offensive content (pornography, Lolita, erotic cartoons, racism, xenophobia)
 - 2. online contact of the child by the aggressor
 - 3. gaming and internet addiction (>4h/day)
 - 4. commerce and advertising without parental supervision
- F. negative perception of children by parents
- G. Repeatedly threatening the child with punishment
- H. Child neglect leads to assuming responsibilities that they cannot handle.
- J. Non-organic failure of development = due to emotional neglect, retardation and growth and weight deficit occur (primary attachment disorder)
- K. divorce - forcing a party to take action

Doctor's roles

- Detection
- objectification
- Report





Detection - circumstantial signs

- delayed presentation to the doctor for trauma (the family explaining this with expressions such as "the child did not complain")
- Vague, inadequate explanations regarding how the traumatic injuries occurred
- discrepancy between history and severity, location, or type of lesions
- abnormal behavior of parents, lack of concern, hostility towards the doctor, refusal of hospitalization
- abnormal behaviors of parents in relation to children.



Detection - psychological/behavioral signs

- Behavioral disorders (apathy, irritability, impulsivity, aggression, lying, running away from home, stealing, alcohol and drug use, etc.)
- Sleep disorders (insomnia, drowsiness, restless sleep, nightmares, etc.)
- Eating disorders (anorexia, bulimia)
- Self-stigma, self-blame
- Tics (blinking, nail biting, etc.)
- Enuresis, encopresis;
- Negligence in carrying out tasks and inability to adhere to an imposed schedule
- Difficulties in relationships and communication
- Decreased school performance, absenteeism



Signs of physical abuse

- skin lesions, usually located in areas not affected by the fall: inner thighs, face, genitals)
- finger-shaped ecchymoses located on the face, neck, upper limbs, trunk
- traumatic injuries of different ages
- traces of binding of hands, feet or mouth
- burns: with cigarette butts, hot metals, by friction (dragging the child at high speed), preferentially located on the face, head, perineal-genital region, buttocks (punishment for enuresis/encopresis)
- traumatic alopecia (hair pulling)
- scalp hematomas (punch)
- lingual frenulum rupture (forcing a spoon into a child's mouth or putting a gag in it)
- eardrum injuries (hitting the ear with the palm of your hand)
- retinal hemorrhages, lens luxation, subdural and subarachnoid hemorrhages, without external lesions - characteristic of shaken baby syndrome (repeated shaking or jolting of the minor, common in infants, as a method of making them stop crying)
- subdural hematomas, brain injuries
- fractures: nasal pyramid, long bones (single or multiple, of different ages)



Signs of sexual abuse

- recent or old defloration,
- recent anal lesions (multiple fissures, radial) or old (scars, gaping anus),
- suggestive signs of contracting a venereal disease: venereal vegetations, irritation, unpleasant odor, etc.
- sperm in the vagina, anus, or perianal region
- pregnancy
- age-inappropriate sexual behavior
- uncontrollable fear of men (in girls)



Proofs of neglect

- skin condition (dirt, excoriations, dermatitis)
- malnutrition, underweight, nutritional deficiencies
- non-organic weight and height hypotrophy
- lack of language development, age-specific skills
- medical neglect (diarrheal diseases, cavities, etc.)



Report

- MANDATORY
- made by:
 - minor
 - the other parent
 - medical staff
 - any other person who has reasonable suspicion
- signaling:
 - staff: General Directorate of Child Assistance and Protection (DGAPC)
 - by phone: 983 and 9852 (of the General Directorate of Child Assistance and Protection) or 116111 (Children's Hotline Association).