Fractures of the jaws

Trauma in the head and neck area can be small and confined as; vertical root fracture, external root resorption. Or something extensive that involves facial nerves and cranial base.

Luckily most injuries involve the teeth alone, the more serious injuries that involves bone and soft tissues are usually rare.  
Diagnosis of a trauma is easy, but the key factor is choosing the correct radiograph to diagnose the fracture. For example vertical root fracture is very difficult to diagnose using a single periapical radiograph.

In maxillofacial injuries at least two 2D radiographs in different projections are required “Ideally the radiographs should be 90 degrees to each other”. You should keep in mind that each clinical presentation has its own protocol “what type of radiographs to use”, also 3D radiographs show a lot more than 2D radiographs.

Skull views “Refer to the book for further reading”  
Anterior-posterior skull view is the gold standard radiograph, It gives a general view on the skull as a whole. Sinuses require Water’s view to see them. Condylar neck requires Towne’s view. Submentovertex view is used for viewing the zygomatic arch. Lateral oblique “ which is used for the body of the mandible and ramus lesions” and other views.

There are multiple types of teeth trauma some of them can be seen on radiographs and some can’t.  
Concussion “which is a crushing injury in which the tooth didn’t move but there was enough pressure that the PDL was affected” can’t be seen on radiograph. If the injury was left without treatment “because of incorrect diagnosis” then after a while chronic radiographic signs may appear like “internal root resorption, external root resorption, obliterated pulp”.  
Luxations “including inclusion” “mean that the tooth moved from its place” some of them are easier to be seen than others, in intrusion the PDL is very limited because it’s been crushed.  
If the tooth is moved buccolingually then it won’t appear on periapicals, and if left untreated it will cause resorption to the bone surrounding the tooth.  
Some of dental traumas only appear in 3D imaging.   
Note: if the bone is involved in the fracture with the tooth then the splinting period will be longer.

Fractures involving bone:  
  
The most common facial fracture is nasal bone fracture, then comes the mandibular fracture, this happens for males on weekends “due to fist fights”, western data. But for our region the main cause is road traffic accidents, and they’re more serious than simple fractures.

In any fracture you should follow the 4S method: “these signs present directly after fracture injuries”  
1-Symmetry  
2-Sharpness “of cortical boundaries”  
3-Sinuses  
4- Soft tissue swelling “even though soft tissues don’t appear that well on panoramic radiographs”.

There used to be a classification for the fractures depending on the pull of the muscles, they were divided into favorable and unfavorable prognosis. But nowadays due to the proper reduction and the presence of fixing plates “to fix fractures” the prognosis is usually the same according to muscle pull.  
  
Note: If there’s a parasymphyseal fracture on one side then there will most probably be another fracture on the condyle of the contralateral side, because the mandible is horse shoe in shape s the forces will be distributed in a way that causes this correlation.

The most important way to classify fractures clinically:  
1-Simple : the fracture is enclosed.  
2-Compound: the fracture is open to the outside “oral cavity, PDL” so any fracture involving the alveolar socket is a compound fracture.

This classification determines the possibility of infection of these fractures and this determines the antibiotic protocol to be followed for each type.

If a fracture is comminuted especially in esthetic areas, then the proper reduction for these fractures is going to be more difficult so restoring the original shape will also be more difficult.

Green stick fracture: is a fracture that happens in young kids because their bone is elastic, so the periosteum is intact, the bone isn’t 2 pieces.

Pathological fractures: this fracture happens due to low force impact “like eating a piece of bread” after the bone being weakened by existing disease “cystic lesion”.

Fracture line can be:  
1- radiolucent if the bones are away from each other.  
2-radiopaque if the bones are overlapping each other.  
3-step deformity: if the bones are touching each other but one or both are vertically displaced.

Mandibular fractures:   
First we take OPG for scouting then another 2D radiograph “PA skull, PA ceph …etc”.  
3D is done only when we think that there is more to the fracture than what it appears.

Sometimes a gap of a suture can be mistaken for a gap of a fracture, so you should know the locations of the sutures.

Maxillofacial skeleton fractures:  
These are more challenging than the mandibular fractures surgically, all sutures should be brought back together, to preserve the shape of the bone and horizontal and vertical relationship.

In these fractures because they result due to high impact strength injuries, assessment of the vital signs is important and a MRI to the brain should be taken.  
  
These fractures should be assessed using computed tomography “for diagnosis and treatment planning”. Plain radiographs can be used when there is no other option “not very helpful”.

Nasal fractures:  
happens due to fights, If it’s isolated fracture low dose lateral plain radiograph can be enough for diagnosis, but if not 3D radiograph is required “it becomes part of maxillofacial skeleton fractures”.

Note: if the fracture happened a long time ago then the boundaries of the fractured bone around the fracture line will be corticated.

Zygomatic complex fracture:  
It’s the 3rd most common fracture   
it used to be called a tripod fracture, but they discovered a forth arm for the fracture. It has pathognomonic clinical signs “flattening of the cheek, hemorrhage and bruising of the eye and nose, the sinuses become filled with blood”.  
The fracture happens on the zygomaticofrontal suture, zygomaticomaxillary suture, zygomaticotemporal suture, so when bringing it back the sutures must be back in its place.  
3D imaging is required “CT or CBCT”.

Le Fort fracture of skull:  
it’s a classification for the most common mid face skull fractures according to Le fort, and they become more severe when increasing the classification  
Le fort 1: fracture of the maxilla without lateral pterygoid plates.  
Le fort 2: fracture of the nasal bridge “more superior in position to the previous class” “when the nasal bone is separated from the frontal”  
Le fort 3: craniofacial dissociation “when the zygoma is separated from the frontal bone”.   
  
Note: In real life you can never get a patient that is a clean Le fort1 or 2 or 3.

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