



## "Seven Deadly Sins" in Facial Trauma - Number Four, Missing Facial Fractures. Some Common Causes of Concerns, Complaint and Catastrophe and How to (Hopefully) Avoid Them.

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*Disclaimer - This review is not an extensive evidenced based review of the literature. It is based on the past 20 years experience I have gained in assessing and managing facial injuries. Its principles have served me well (so far). Hopefully it will help those readers who see these injuries on an infrequent basis.*

### **'Missing' fractures of the face**

Minor injuries to the face are very common in the UK. Most occur in children. Major facial injuries are less frequently seen in the UK, as motor vehicle collisions (MVC) now account for only about 5% of facial trauma. This reduction is partly due to seat belt and drink driving legislation. In most emergency departments therefore, patients attend as "walking wounded", that is with isolated, or multiple (but not life threatening), injuries. Common causes include assaults, falls and sporting injuries. In the UK, alcohol is commonly associated, making assessments difficult in some patients.

Fractures on the facial bones that are significantly displaced are usually self evident. There is usually noticeable deformity, functional impairment and the patient is in a fair amount of pain. However this may not be the case in every fracture. Those that are less displaced, or minimally displaced can be easily overlooked, especially if the patient is non cooperative, drowsy, or swollen when they are being assessed. Swelling can take up to a week or more to fully settle and so clinical examination is never completely reliable during these early stages.

Nevertheless, a few useful symptoms and signs are commonly described. If present these indicate the probability of fracture. Some of them include:

1. A well defined 'black eye' (periorbital haematoma) - fracture involving the eye socket
2. A particular type of 'red eye' (subconjunctival haematoma)- fracture involving the eye socket
3. Fresh bruising under the tongue (sublingual haematoma) - fracture involving the lower jaw
4. Palatal bruising (Guerin's sign) - fracture involving the upper jaw
5. A change in the patient's bite (Dysocclusion) - various fractures
6. Numbness of the lower lip - fracture involving the lower jaw
7. Bleeding from one side of the (uninjured) nose - various fractures
8. Bleeding from the ear - possible skull fracture
9. Bruising behind the ear (Battle's sign) - fracture involving the skull
10. 'Tap water' type discharge from the nose - fracture involving the skull

When present these signs are suggestive of a fracture. The likelihood that there is a fracture in the associated bone(s) varies. Some, such as a periorbital haematoma and sublingual haematoma are considered by many to be of very high diagnostic accuracy, although they give no indication as to the severity of the fracture itself. In some cases the fracture may be no more than a crack in the bone. Imaging ('Xrays or CT scan) may then be undertaken on the basis of such findings, even if the fracture is not obvious. There are, of course exceptions to this 'rule'.

Children can be both difficult to assess and difficult to diagnose. Their bones tend to be soft and more 'bendy' compared to an adult. Fractures can therefore be harder to diagnose as the typical signs of a fracture in adult bone may not be present. Fractures of the eye socket are a particular diagnostic hazard for the inexperienced. The child may present with pain around the forehead and repeated vomiting following an injury, which could be misinterpreted as a head injury. They may be uncooperative and agitated and refuse examination of the eye. The so called 'white eye blow out fracture' is one of the few facial fractures where surgery must be undertaken as an 'emergency'. In this injury the floor of the eye socket has fractured and some of the nearby fat (and extra ocular eye muscle) becomes trapped and 'pinched' between the fragments. This cuts off the blood supply to the herniated tissues. Failure to release the trapped eye muscles can result in permanent damage and double vision.

As with all trauma the mechanism of injury may provide clues as to what injuries a patient may have.

1. If the mechanism involves a single blow, the fracture is often localised to the point of impact and surrounding area (for example the cheek, or nose)

2. The higher the impact the greater the chances of 'deeper' fractures. Being kicked by a horse, or stuck by an object can transfer considerable energy if this strikes the patient 'full on'.
3. Some mechanisms may be more complicated. Secondary impacts may have occurred. For instance the patient may have been punched on the face and knocked over, striking another part of their face / head or body on another object.
4. Some mechanisms may suggest fractures remote from the point of impact. A blow to the cheek may result in a deeper fracture along the floor of the eye socket, even if the cheek itself is not fractured. Similarly, a blow to the chin may fracture both the front of the lower jaw and one or both of its hinge joints (so called 'Guardsman's fracture').
5. A blunt force applied over a curved bony surface may result in both splitting of the skin and a fracture in the underlying bone.
6. For obvious reasons the possibility of a neck injury should always be considered and confirmed / ruled out. Front-to-back directed forces to the face (such as following a fall) can result in hyperextension injuries to the cervical spine and spinal cord injury (notably in the elderly). Whiplash is said to be commonly associated with some types of facial injuries.
7. Blunt trauma to the forehead can result in blindness, even in the absence of fractures
8. All mechanisms carry greater significance in the elderly where the bones are more fragile secondary to age related changes or medication (osteoporosis).

### **Assessment**

This will be tailored, depending on the condition of the patient, their symptoms and signs and suspected injuries. Useful questions to ask would include:

1. When the injury occurred – date and specific time?
2. Mechanism of injury – high / low / multiple impacts
3. Loss of consciousness?
4. Any numbness or weakness in the face?
5. Progression of symptoms since time of injury
6. Any change in the function of the face (eg vision, double vision, obstructed breathing through the nose, restricted mouth opening, deranged bite)?
7. Any change in the appearance of the face?
8. Other injuries?
9. If there are associated bites, lacerations or abrasions the tetanus vaccination status should be checked.

Examination of the head and neck should be performed in a sequential fashion (soft tissues, facial skeleton, teeth). Following this, plain film radiography ('XRays') may then be required. Not every facial injury needs an Xray taken - the doctor needs to weigh up the risks of requesting an Xray (ie the risks of irradiating the patient), against the benefits of finding a fracture present (and the treatment it will require). Not all fractures of the face need an operation. 'Cracks' are generally managed with specific advice and may be kept under review. Therefore in some cases it may be reasonable to simply assume a crack is present, give appropriate advice to the patient and avoid irradiating them. This is a judgement call which needs experience.

Appropriate follow up and advice should always be considered. Not all facial injuries need to be referred to a 'specialist', but the examining clinician needs to be confident that there are no significant injuries if they are going to discharge the patient. Most fractures can be successfully treated within a few weeks of injury, but with the passage of time surgery becomes trickier and may require additional incisions that may not have been required had the patient been treated sooner.

Understandably patients may not be happy with the prospect of an extra scar on their face, because a fracture was 'missed'.

### **Medico-legal issues that can arise**

- The medicolegal implications of whether a fracture is present or not, are self evident when it comes to personal injury claims or court proceedings. However fine 'cracks' in the facial bones (which are technically fractures) can not always be proven (or disproven) with absolute certainty based on clinical examination and 'XRays'. There will always be an element of judgement by doctors - a balance of probabilities.
- 'XRays' have limitations in diagnosing (or excluding) the presence of fine fractures.
- Clinicians tend to err on the side of caution and if in doubt, manage such patients as though they have a fracture. This is to minimise the risks of complications. This caution can then sometimes become misrepresented as 'proof' that a fracture is present.
- Not all facial injuries need X-rays, but they do need careful examination. Suspected isolated nasal fractures are no longer X-rayed for medicolegal reasons. The diagnosis is made following careful clinical examination only.
- It is not usually possible to say with certainty how any injury occurred. Often clinicians are asked to state in reports whether a fracture occurred as a result of an assault or fall. Such information falls more under the remit of forensics, especially if this needs to be stated with certainty.
- Many facial fractures occur as a result of an alleged assault. A police report maybe required at a later date. Therefore clear and accurate documentation of the initial clinical findings in the notes is very important.