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## MAXILLOFACIAL INJURY

# Diagnosis and management of common maxillofacial injuries in the emergency department. Part 3: orbitozygomatic complex and zygomatic arch fractures

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This is most commonly seen after assault, but any blow to the cheek may give rise to a fracture. Zygoma fractures are easy to miss and displaced fractures require treatment within 10 days. Untreated fractures may cause a cosmetic deformity (flattening of the cheek) or limited mandibular movement caused by the depressed zygoma impinging on the coronoid process of the mandible.

### HISTORY

Enquire about the mechanism of injury; zygoma fractures usually occur after blunt trauma. Altogether, 70–90% of patients will complain of infra orbital/upper lip numbness on the affected side. This may involve the maxillary central, lateral, and/or canine teeth.

The affected side of face may be flattened when compared to the other side, although this can often be difficult to appreciate especially in the presence of swelling.

The patient may complain of a cosmetic defect on the affected side.

The patient may have epistaxis because of disruption of the membrane of maxillary sinus or an abnormal occlusion because of the fracture preventing normal mandibular movements.

### CLINICAL EXAMINATION

A malar fracture should be suspected if periorbital oedema, ecchymosis of the lower lid, and/or a lateral sub conjunctival haemorrhage (bloodshot eye) is present.

A flat malar arch is best assessed from behind the patient's head. Compare symmetry with the opposite side. This is best appreciated immediately post trauma or a number of days later when the oedema has subsided.

Zygomatic arch fractures can be clinically difficult to diagnose as the only signs may be a dimple palpable on the arch, which may or may not be tender, and or a decreased range of mouth opening.

The patient's range of mouth opening should be greater than 30 mms. If mouth opening or lateral excursions of the mandible are restricted or cause pain a malar fracture should be suspected.

Palpate the lateral and inferior rim of the orbit to assess the presence of pain or a step deformity; this may be difficult to appreciate when swollen. Assess if the malar body is tender. Intraorally assess the malar buttress (bony curve in buccal sulcus above the first and second molar teeth) for

tenderness or a step in the curvature again comparing with the opposite side.

Eye injury is very common in midface trauma; therefore, a thorough ophthalmological examination is mandatory in all suspected malar fractures. An external exam should note any lacerations: assess extraocular motility, visual acuity, visual fields, and the pupillary light reflex. The patient must be assessed for diplopia, ophthalmoplegia, hypoglobus (lowered pupillary level), enophthalmos (sunken eye), and proptosis. The integrity of the optic nerve must be established even if the eye is closed by soft tissue swelling. This is accomplished by shining a light over the closed eye and getting the patient to confirm the presence or absence of light. An ophthalmological review is essential in the presence of a through and through lid laceration. See figs 1 and 2.

### RADIOLOGICAL ASSESSMENT

Radiographs are used to confirm the clinical picture. The standard views used are the occipitomenital 15/30 views and the submento vertical view, which is specific for arch fractures.

Radiographs can be difficult to interpret; therefore, a systematic approach should be adopted when interpreting occipitomenital films.

Is the maxillary sinus clear? Opacification or fluid levels in the maxillary sinus are suggestive of a fracture.

The sinus and orbital outline should be symmetrical and there should be no evidence of a step in the bony outline (fig 3).

1. Orbital outline
2. Sinus outline
3. Elephant's trunk (as it looks like one) made up of zygomatic line laterally, which extends along the superior margin of the zygomatic arch and body, and the maxillary line medially, which extends along the inferior margin of the arch, body, and buttress of the zygoma and along the lateral wall of the maxillary sinus.
4. Coronoid process—the tip of which should be equidistant from maxillary line on each side.

The most likely areas of fracture on an occipitomenital radiograph are known as hotspots (fig 4). Particular attention must be given to these hotspots while examining and occipitomenital x ray. Although these hotspots are useful the clinician must still fully examine the x ray (fig 5).

See end of article for authors' affiliations

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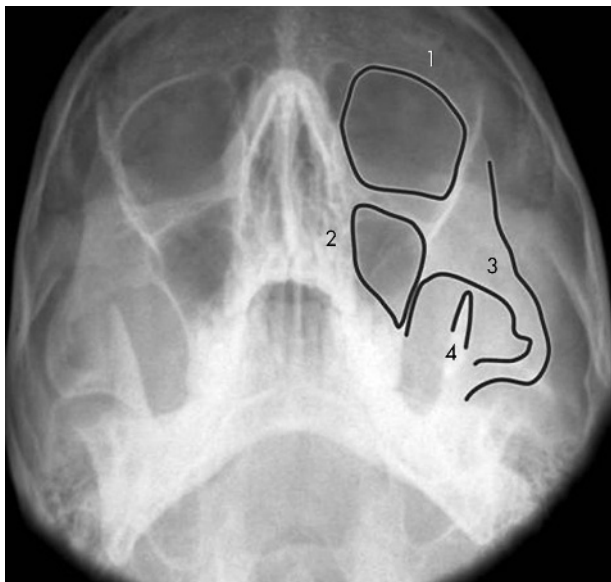
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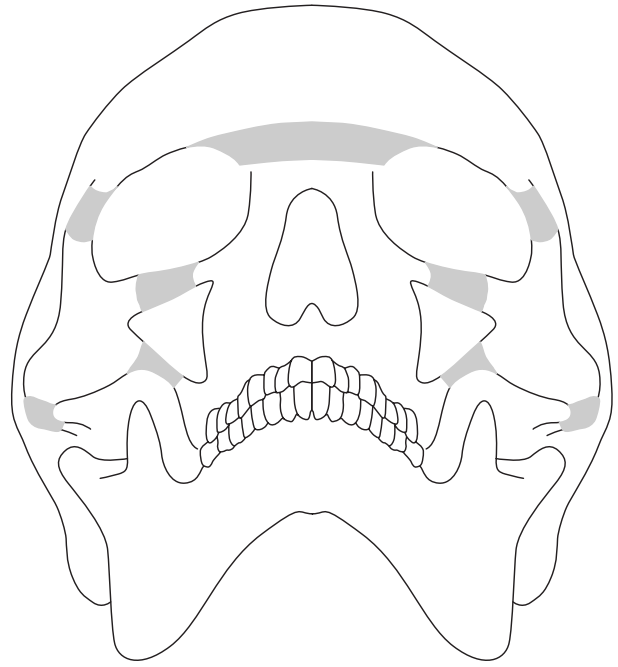
**Figure 1** Intraoral palpation of malar buttress



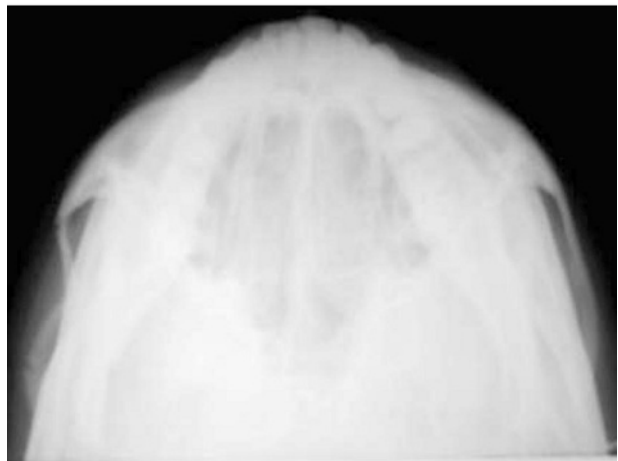
**Figure 2** Area of reduced skin sensation in fracture of the orbitozygomatic complex



**Figure 3** Outline of relevant anatomy on an occipitomental radiograph



**Figure 4** Hotspots for identifying fractures on occipitomental view



**Figure 5** Occipitomental 15 and submento vertical view showing right arch fracture

## INITIAL MANAGEMENT

Surgery is indicated when there is impairment of function—that is, limited mouth opening—and/or when the patient complains of an aesthetic problem—that is, a flattening of one side of the face. It is not specifically indicated for parasthesia. Surgery is often best deferred until the swelling has settled and the patient can be assessed fully. In all patients with suspected malar fractures it is best to advise them to avoid nose blowing as this may result in surgical emphysema. The patient should also be advised to avoid pressure on the effected side.

## SUPRA-ORBITAL RIM FRACTURE

Often occurs in combination with fractures of the zygoma. They need to be referred for a maxillofacial opinion as a very unpleasant orbital dystopia can result in untreated fractures, which is more difficult to correct at a later date.

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## Suggested further reading

Al-Qurainy A, Stassen LFA, Dutton GN, *et al*. The characteristic midfacial fractures and the association with ocular injury: A prospective study. *Br J Oral Maxillofac Surg* 1991; **29**:291–301.

Dolan KD, Jacoby CG. Facial fractures. *Seminars in roentgenology* 1978; **13**:37–51

Fonseca RJ. Oral and maxillofacial surgery. Volume 3: trauma. London: Saunders, 2000:149–205.

Holt JE, Holt GR, Blodgett JM. Ocular injuries sustained during blunt facial trauma. *Ophthalmology* 1983; **90**(1):14–8.

Mc Grigor B, Campbell W. The radiology of war injuries (part VI: wounds of the face and jaw). *Br J Radiol* 1950; **23**(276):685–96.

Trapnell D. *Diagnostic radiography in maxillofacial injuries*. Rowe NL, Williams JLL, editors. Edinburgh: Churchill Livingstone.

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