

BATLS

Battlefield advanced trauma life support

Chapter 9 Maxillofacial Injuries

AIM

0901. On successfully completing this topic you will be able to demonstrate the techniques of assessing and managing battlefield maxillofacial injuries. Specifically you will be able to:

- Discuss the general management of unconscious, facially injured casualties.
- Discuss the anatomy and physiology of specific facial injuries.
- Identify the criteria for stabilisation and evacuation.
- Demonstrate your ability to assess specific injuries using a head injury manikin.

INCIDENCE

0902. On the battlefield, between 10 to 15% of casualties who reach role one care have maxillofacial injuries. Approximately 50% of jaw injuries on the battlefield are of the blunt, civilian type. With penetrating injuries, more are caused by fragments than by gunshot.

ANATOMY

0903. The face is of crucial importance because it encompasses the airway and is in close proximity to the brain and the spinal cord. The face is usually divided into three parts - the mandible, the middle-third and the upper-third (see Fig 9.1). The upper-third forms part of the cranium; injuries in this region are covered in Chapter 8.

The Mandible

0904. This is a single bone to which numerous muscles are attached, notably the muscles of the tongue. Certain types of mandibular injury will prejudice the airway by allowing the tongue to fall backwards, or by causing gross swelling of the tissues around the upper airway.

Middle-third

0905. The middle-third of the face is composed of many relatively thin plates of bone, particularly those related to the orbits, nasal cavity and paranasal sinuses. Fractures of this area may involve the base of the skull. Obstruction of the airway may occur and

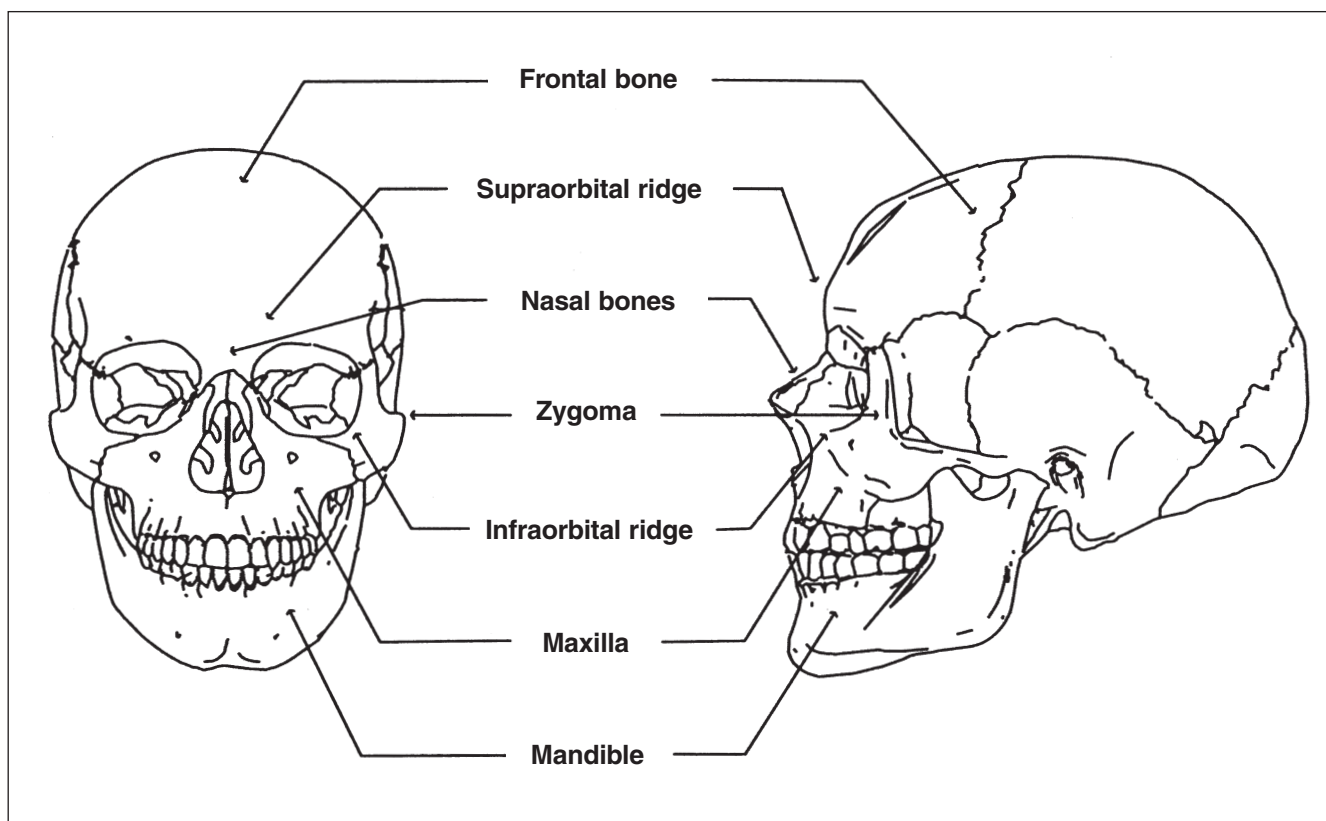


Fig 9.1 Anatomy of the facial skeleton.

haemorrhage from branches of the maxillary artery may require internal packing.

INITIAL ASSESSMENT AND MANAGEMENT

0906. The aims of all primary treatment on the battlefield are:

- To preserve life.
- To prepare the casualty for evacuation.

**Remember the four phases of management:
Primary survey, Resuscitation,
Secondary survey, Definitive care.
(see Chapter 2).**

PRIMARY SURVEY AND RESUSCITATION

In maxillofacial injuries the airway is at risk and there is an increased risk of damage to the Cervical spine and brain. Remember the A B C D E routine.

0907. The majority of maxillofacial injuries will be found during the secondary survey. Of prime importance are injuries to the lower face resulting in bleeding and soft tissue swelling, or both. These can cause immediate or delayed airway obstruction (see paragraph 0407). Albeit they may also produce haemorrhagic shock. These problems need to be detected and dealt with in the primary survey.

Airway

0908. Identify and remove or bypass, all causes of obstruction. These may include blood, vomit, fragments of bone or teeth as well as post-traumatic swelling of the adjacent tissues.

0909. Carry out airway management in accordance with the principles of BATLS. In some instances, placing the casualty in the correct position (in this case the three-quarter prone position) will allow them to maintain their own airway. Failing this, the jaw-thrust or chin-lift manoeuvre may be required and the airway maintained with an oral, nasal or endotracheal tube. Take extra care in placing tubes in casualties with facial injuries, particularly when there is the possibility of a fracture involving the base of the skull. (See Chapter 8). In the early stages, the importance of correct positioning to maintain the life of the casualty cannot be over-emphasized. Too many maxillofacial casualties die unnecessarily by being left unattended in the supine position.

No severe maxillofacial casualty should be left unattended in the supine position.

Breathing

0910. It is not enough merely to clear the airway. You must ensure that the casualty is ventilating adequately. This is covered in Chapter 4.

Circulation

0911. Unless very severe, facial injuries are rarely a cause of hypovolaemic shock. If a casualty exhibits signs of shock out of proportion to his facial injuries, you must consider the possibility of covert bleeding elsewhere.

0912. External bleeding from the head and neck can be controlled with pressure dressings - taking care with vital structures such as the airway and eyes. Bleeding from the mid-face may require a post nasal pack applied in the standard manner. As an emergency measure, two *Foley* (urinary) catheters (12 or 14 French gauge) can be passed through the anterior nares to the back of the nose, the bulbs inflated and the catheters then pulled gently forwards - anterior nasal packs can then be inserted.

Disability

0913. Assessment of the pupils is difficult in orbital injuries because of bleeding or oedema. Take care to avoid aggravating ocular damage.

SECONDARY SURVEY

0914. The head, face and neck are fully examined and assessed as part of the secondary survey. This examination takes time and must be carried out in good light. Comprehensive records are essential. Thoroughly check for, and record, the following:

- Lacerations.
- Bruising, for example mastoid and periorbital - indicating basal skull fracture - the neck and the floor of the mouth.
- Cerebrospinal fluid/bleeding from the ears, nose or mouth.
- Tenderness, depression or deformity of bones.
- Malocclusion.
- Proptosis, enophthalmus, restriction of eye movement.
- Visual acuity (mid-face injury may lead to blindness).
- Facial muscle weakness, for example upper, mid- or lower face.
- Sensory loss, for example cheek or lower lip.

Beware of airway compromise caused by continuing haemorrhage and soft-tissue swelling.

Evacuation

0915. When preliminary treatment has been completed, evacuate the casualty to a specialist unit for definitive treatment. Casualties without a definitive airway should be evacuated in the three-quarter prone position and must be carefully supervised. Attendants travelling with maxillofacial cases must be instructed in the dangers and management of respiratory obstruction.

The priorities for evacuation of maxillofacial casualties are:

- P1 Airway problems.
- P2 Multiple facial injuries without airway compromise.
- P3 Uncomplicated maxillofacial injuries.

Pain Control

0916. For most facial injuries, no immediate splinting is required, but mobile painful fractures can be gently supported using two crepe bandages; one being placed vertically and the second horizontally (around the forehead) - and the two anchored together with safety pins. Analgesia may be given but care must be taken to avoid respiratory depression.

Fluid Replacement

0917. Replace fluids orally or intravenously as indicated (see Chapter 5).

SUMMARY

- In maxillofacial injuries, the airway is most at risk.

Do not let the casualty die for want of an airway.

- Look for associated injuries, such as basal skull fractures, provide simple splintage for mandibular fractures and adequate analgesia. Evacuate most casualties in the three-quarter prone position and ensure adequate supervision.

**Skills Station 7
Maxillofacial Injuries**

AIM

The aim of this skills station is to give you the opportunity to:

- Demonstrate skills in examining maxillofacial injuries
- Perform primary and secondary surveys of the middle-third and lower-third of the head.
- Discuss priorities of management of casualties with maxillofacial injuries.

EQUIPMENT

Mr Hurt (head injury manikin).
A skull.

SKILLS PROCEDURES

Primary Survey

Remember the A B C D E routine.

- Examine for cervical spine injury and immobilise if necessary.
- Check pupillary size and response to light.
- Check:

Alert

Voice responsive

Pain

Unresponsive.

Secondary Survey

(to determine the extent of the injuries).

External

- *Visual.* Carry out a visual inspection of all surfaces of the head and face. Note asymmetry and alterations in normal proportions:
 - Swelling and bruising.
 - Lacerations.
 - Bleeding from nose or ears, with or without cerebrospinal fluid leakage.
 - *Palpation.* Carry out a systematic bilateral bimanual examination of bony surfaces and margins to detect breaks in continuity:
 - Cranium.
 - Orbital rims.
 - Nose.
 - Zygomas and zygomatic arches.
 - Condyles.
 - Posterior border of the ramus and the lower border of the mandible.

Internal

- *Visual.* Note the following:
 - Broken, missing or displaced teeth.
 - Alteration in alignment of teeth.
 - Failure of the teeth to meet correctly (malocclusion).
 - Limitation of mandibular movement and/or asymmetrical opening.
 - Haematomas.
 - *Palpation.* Palpate the teeth, dental arches and palate to detect abnormal mobility.

Detailed Examination

- Carry out a more detailed examination of positive findings.
 - Perform mini-neurological survey (Glasgow Coma Scale):
 - Eye-opening response.
 - Verbal response.
 - Best limb motor response.
 - *Scalp laceration.* Palpate for extent of possible bone injury and presence of foreign bodies.

- *Eyes.*
- Check pupillary size and response to light again.
- Check for exophthalmus (proptosis) or enophthalmus.
- Check subconjunctival haematoma or hyphaema (blood behind cornea).
- If conscious, check visual acuity, eye movement and diplopia.
- *Ears.* Check for haemotympanum (blood behind the eardrum).

- *Mandible.* Check for normal mandibular movement.

General Assessment

- Carry out a general assessment of the whole casualty for additional injuries.

Continuing Re-assessment

- Continually re-assess the casualty for signs of deterioration.