

Invited Review Paper
Trauma

Advanced Trauma Life Support (ATLS) and facial trauma: can one size fit all?

Part 2: ATLS, maxillofacial injuries and airway management dilemmas

M. Perry¹, C. Morris²

¹Regional and Maxillofacial Trauma Units, Belfast, UK; ²Derbyshire Royal Infirmary, Derby, UK

M. Perry, C. Morris: *Advanced Trauma Life Support (ATLS) and facial trauma: can one size fit all?*. Int. J. Oral Maxillofac. Surg. 2008; 37: 309–320. © 2007 International Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

Abstract. Maxillofacial trauma poses an obvious threat to the patient's airway, which may not be immediately evident. In the multiply injured patient, the co-existence of actual or potential injuries elsewhere may complicate airway management, notably in the presence of full spinal immobilization. Following high-velocity trauma, injuries to the cervical spine must be assumed to be present. They also need to be ruled out in an appropriate and timely manner, as patients may wish to sit up. Assessment and management of the airway in maxillofacial trauma can be difficult, requiring a senior anaesthetist or other individual appropriately trained in emergency airway care. A number of management options may exist to protect the airway, each with advantages and drawbacks. Agitation and vomiting can occur unexpectedly and need to be managed safely with due consideration to the spine. Oral and maxillofacial surgeons need to be aware of these dilemmas and their early warning signs, and be skilled in emergency surgical airway procedures, especially if involved as part of the trauma team. Prolonged immobilization is associated with significant morbidity and mortality. A number of protocols currently exist for 'clearing' the spine. Imaging now plays a greater role, especially in the obtunded, unconscious or intubated patient, and this is discussed.

Keywords: ATLS; Priorities; Airway; Vomiting; Spine; Transfer; Assessment; Emergency; Craniofacial; Trauma.

Accepted for publication 6 November 2007
Available online 18 January 2008

Maxillofacial trauma poses an obvious threat to the patient's airway. In many cases, this is best managed by allowing the patient to position themselves upright, thereby maintaining their own airway. Following high-velocity trauma, the co-existence of craniofacial injuries with actual *or potential* injuries elsewhere may preclude this approach. This is particularly the case in the presence of spinal or pelvic fractures, which may be put at risk of displacement if loaded axially through the weight of an upright torso. Following 'significant' craniofacial trauma, or high velocity trauma, injuries to the spine (notably cervical) must be assumed to be present until excluded^{1,65}. Current opinion is to transfer and maintain these patients in the supine position, thereby providing some degree of spinal protection. The clinical dilemma arising from this strategy is how best to manage the airway. Not all patients need to remain supine indefinitely, but which ones can we allow to sit up safely in the early stages of their assessment?

Airway management in maxillofacial trauma needs a senior anaesthetist or other individual appropriately trained in emergency airway care. For a number of reasons all patients, but especially those with maxillofacial injuries, may vomit unexpectedly. Unfortunately this can occur at any time during their management, including when available assistance is limited. In such unexpected scenarios what can the single-handed clinician do to simultaneously protect both the airway and any spinal injuries? Simple measures will be discussed, but in the event of inability to maintain or secure the airway, maxillofacial or other trained surgeons must be prepared to provide appropriate access surgically.

Part 1 of this series of review articles discussed the importance of understanding how the mechanism of injury can help identify possible hidden injuries¹⁰⁷. Following 'significant' craniofacial trauma, or high-velocity trauma, cervical spine protection is necessary in the early stages of assessment, and this involves the use of a well fitting hard collar. Unfortunately such collars can restrict access to the oropharynx, face and anterior neck, which on occasion may be urgently required. Definitive repair of maxillofacial trauma may also require the head to be turned in order to gain access to some of the injuries. In such instances, when can the neck be 'cleared' on clinical grounds and, if not (notably in unconscious patients), can it be cleared by any other means?

Initial considerations

In all patients, irrespective of whether facial injuries are present or not, the first priority is always to assess the airway, while simultaneously protecting the (cervical) spine. This initially involves seeking a verbal response to questions like 'what happened?' or 'how do you feel?'. Although an appropriate verbal response is encouraging, when facial injuries are evident this should always be followed by direct inspection of the mouth and pharynx. Oral and facial bleeding can often go unrecognised unless carefully looked for, and foreign bodies must be carefully removed. Correctly fitting rigid collars restrict mouth opening and make assessment of the oropharynx difficult, but in all cases if the potential for airway compromise exists, these should be loosened enough to enable thorough examination. During this time manual in-line immobilization of the neck must be correctly performed.

Immediate and delayed airway compromise in facial trauma may arise as a result of varying combinations of tissue displacement, oedema and bleeding^{3,73}. Foreign bodies, vomit and traumatic brain injury are also common causes. In awake, supine patients facial bleeding may not be obvious if the blood is swallowed, but if it continues uncontrolled it places the patient at risk of vomiting later (possibly when they are under less supervision). With fractures of the mandible swallowing may be painful and not as effective in keeping the airway clear¹⁰⁰. Retropharyngeal haematoma, secondary to high cervical spine injuries, has also been reported to result in delayed airway obstruction⁷⁸, emphasising the need for regular and thorough reassessment of the airway in all patients. Its presence should also alert the clinician to the possibilities of a cervical spine fracture and development of progressive respiratory failure. Urgent anaesthetic assessment is required.

Currently accepted immobilisation of the cervical spine requires either manual in-line techniques, or a hard collar, blocks and straps, although these components lack a sound scientific basis⁶⁰. In agitated patients, attempts to restrain or immobilize the head simply creates a fulcrum, and increased leverage on the neck as the torso moves. In these circumstances, patients may only tolerate a hard collar. Caution is still required, as even this has the potential to displace low cervical injuries in a combative patient^{44,67}. Collars have also been shown to increase intracranial

pressure and compromise the airway directly^{20,69,108}. Agitation can have many causes, notably alcohol, substance abuse and brain injury, but of immediate concern is agitation secondary to hypoxia and pain, as these can often be readily addressed. If the patient fails to settle promptly despite adequate oxygenation, correction of severe hypovolaemia and appropriate pain relief, and essential investigations cannot be undertaken, formal anaesthesia with intubation and ventilation must be urgently considered. This is usually safer than sedating the patient without providing definitive airway control.

Airway obstruction in the supine patient – 'if you leave the patient facing towards heaven, it won't be long before they get there' (paraphrased, original source unknown)

ATLS states that "Cervical spine injury requires continuous immobilization of the entire patient with a semirigid cervical collar, backboard, tape and straps before and during transfer to a definitive-care facility"¹, and it can immediately be seen how the presence of facial injuries can potentially result in complications. Although conscious and supine patients may be able to maintain their airway, this does not mean it is secure and it is constantly at risk. Alcohol, bleeding and brain injury are commonly seen in many patients, especially in the UK, and these increase the risks of unexpected loss of protective reflexes and obstruction. Alcohol intoxication, commonly associated with facial trauma in many countries, is well known to result in both loss of consciousness and vomiting.

Significant soft-tissue swelling also occurs commonly in 'panfacial' injuries and this may prompt the need for early intubation with a view to tracheostomy later. Occasionally, airway-threatening swelling can occur in the *absence* of any fractures, and has been reported in patients taking anticoagulants or those with clotting abnormalities²⁵. Traumatic swelling is made worse by the elevated venous pressures and reduced lymphatic drainage which occur in the supine position¹²². Fractures of the hyoid bone⁷² (seen on the lateral cervical spine film) should also be regarded as a 'marker' of significant injury to the adjacent soft tissues (rather like fractures of the first and second ribs) indicating a risk of obstruction. Swelling can take several hours to develop, highlighting the ATLS principle of re-evaluation.

Download English Version:

<https://daneshyari.com/en/article/3134690>

Download Persian Version:

<https://daneshyari.com/article/3134690>

[Daneshyari.com](https://daneshyari.com)