

Prehospital tracheal intubation in severe facial trauma: a short window of opportunity

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ABSTRACT

A case of severe facial injury is described. The pre-hospital management including pre-hospital anaesthesia and intubation and the importance of advanced anaesthetic skills in rare trauma cases is discussed. In addition the rare situation where large bone fragments are retrieved from the scene and potentially used in reconstruction is mentioned.

INTRODUCTION

A patient with severe facial injuries and airway compromise is presented (see figure 1). Patients with this type of injury are uncommon and often have related head injuries. Prehospital airway management is considered to be difficult¹ and serious facial injuries are an obvious challenge to airway management.² Some patients require immediate rapid tracheal intubation, with the use of drugs, to prevent hypoxaemia and airway contamination. Facial and airway swelling soon after burns are well recognised; a similar situation may occur after serious facial injury.

CASE NOTES

A 38-year-old previously healthy male cyclist collided with a van at the bottom of a hill. The cyclist was wearing a safety helmet. Bystanders kept the patient on his side and supported his head and neck in a neutral position.

When the ambulance arrived, the patient was semiconscious (Glasgow Coma Score (GCS)=11) with bleeding facial injuries. The ambulance crew applied manual inline cervical stabilisation, gave oxygen and kept the patient lying on his side to allow postural drainage of blood.

The patient was in this position 17 min after the incident when the HEMS doctor-paramedic team arrived. Rapid assessment showed severe facial injuries, soft tissue loss and multiple fractures. There was also a de-gloving injury of the right forearm and a compound fracture of the left elbow. GCS was 11 (E2V4M5), and apparent cerebral irritation led to intolerance of the oxygen mask. Initial blood pressure was 138/74 mm Hg, heart rate 69 bpm, SpO₂ 89% and respiratory rate 12/min. Chest ultrasound had the appearance of normally inflated lungs.

A decision was made to sedate the patient to improve tolerance of the oxygen mask and then secure the airway with a rapid sequence induction (RSI) of anaesthesia. The potential for difficult intubation was recognised. Equipment for surgical airway is routinely to hand so no specific further preparations were required.

After successful sedation with ketamine (incremental doses to 80 mg) oxygen was tolerated and nasopharyngeal airways accepted without any loss of airway patency or respiratory drive. A standard RSI was performed with equipment from an 'equipment dump' next to the patient. The patient was kept on his side until induction to maintain airway patency. Anaesthesia was induced with etomidate 10 mg and suxamethonium 100 mg, maintaining manual inline cervical spine stabilisation. An 8.0 mm cuffed tracheal tube was passed at the first attempt (Cormack and Lehane grade 1 view) over a bougie (this intubation adjunct is used routinely for all prehospital intubations in this service). Tube placement was confirmed (disposable CO₂ detector). Sedation was continued with boluses of morphine and midazolam. After induction of anaesthesia, a cervical collar was fitted and bilateral dental bite blocks placed to reduce bleeding.¹ A brief scene survey revealed a large bone fragment which was taken to hospital. The patient was transferred uneventfully to the Royal London Hospital and received by a trauma team. On arrival, considerable swelling had occurred and clinical assessment of the patient by senior clinicians suggested high probability of difficult intubation by the time of arrival. The bone fragment was used in surgical reconstruction/repair of the facial injuries (see figure 2).

DISCUSSION

Serious facial injuries provide all prehospital care providers with a challenge. In our trauma-based system, serious facial injury is uncommon (<3% of cases). Most patients have a related head injury and most are managed with prehospital anaesthesia and intubation. The case described would be difficult to manage without RSI.

UK paramedics who only intubate without the use of drugs (an intervention of questionable value) would be unable to intubate this type of patient who, despite significant airway compromise, had a relatively high GCS. Airway adjuncts may also be rejected. The difficulties of trauma airway management by UK paramedics have been highlighted in a recent NCEPOD report.³ Movement may make things worse and would probably need to be performed with the patient on his side. Rapid transfer to the closest emergency department for definitive airway management (with simple airway adjuncts if necessary) would be an alternative if RSI were not available on scene. This patient had an uneventful RSI and, although facial injuries increase the difficulty of intubation, our database suggests that the failed airway rate for this patient group is not significantly higher than for the

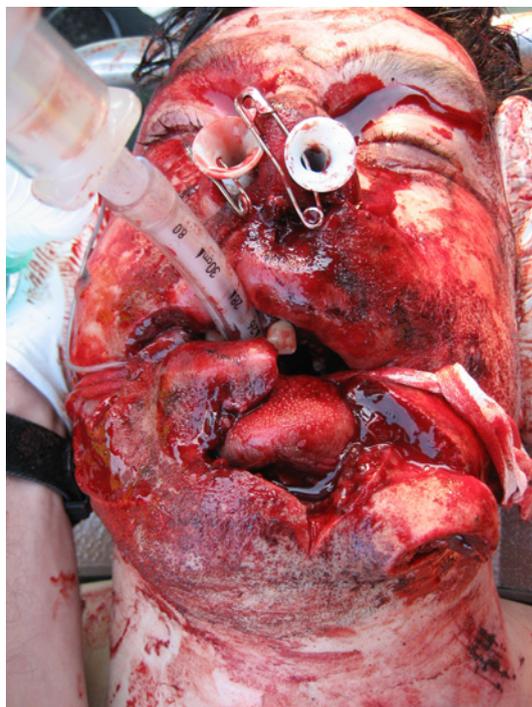


Figure 1 Severe facial injuries after intubation on scene.

trauma group as a whole. We believe that a straightforward, well practised RSI algorithm contributes to a high success rate. Sedation to achieve pre-oxygenation and safe RSI is rarely discussed. It is often used in our practice and, although we are ready to perform immediate RSI in the event of deterioration, this is seldom necessary. Some may think that ketamine may increase agitation and midazolam is available as an alternative. Keeping a trauma patient in a position with postural drainage is a well-recognised technique, which was used in this case. Early swelling after severe soft tissue injury is less well recognised than in burns but can reduce the time for easy intubation. Scene assessment is a fundamental skill in prehospital care but it rarely results in the retrieval of useful tissue as seen in this case.

This type of case is uncommon but illustrates a situation where physicians with anaesthetic skills are important.



Figure 2 After hospital discharge.

Contributors The authors contributed equally to the drafting of this paper.

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