

Difficult Airway Management in A Patient With Penetrating Posterior Cervical Trauma : Successful C-Mac Videolaryngoscopic Intubation in the Lateral Position

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ABSTRACT

Background: Penetrating cervical trauma can present significant airway management challenges, particularly when a retained foreign body prevents conventional supine positioning. In such situations, securing the airway while avoiding displacement of the foreign body is essential.

Case Presentation: We report the case of a 45-year-old man admitted following penetrating posterior cervical trauma with a retained foreign body. On admission, he was conscious, hemodynamically and respiratorily stable, with no neurological deficit. Cervical computed tomography with three-dimensional reconstruction showed the retained object without major vascular or spinal cord injury. Because supine positioning could have displaced the foreign body and aggravated the cervical injury, the patient was maintained in the lateral decubitus position for airway management. After standard monitoring and preoxygenation, general anesthesia was induced with midazolam, propofol, and a neuromuscular blocking agent. Tracheal intubation was performed using a C-MAC videolaryngoscope in the lateral position. Successful intubation was achieved after two attempts. The endotracheal tube was secured, followed by controlled surgical removal of the foreign body, wound exploration, and drainage. The anesthetic course remained uncomplicated, with stable respiratory and hemodynamic parameters. The patient was extubated immediately after surgery without respiratory or neurological complications.

Conclusion: Lateral-position videolaryngoscopic intubation can provide an effective airway management strategy when conventional supine positioning is contraindicated or technically impossible because of penetrating cervical trauma. This case highlights the importance of individualized airway planning, careful avoidance of foreign-body manipulation, multidisciplinary coordination, and preparation for alternative airway strategies.

KEYWORDS: Penetrating cervical trauma; difficult airway; videolaryngoscopy; C-MAC; lateral position; tracheal intubation; airway management; trauma anesthesia.

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INTRODUCTION

Penetrating cervical trauma represents a potentially life-threatening emergency because of the close anatomical relationship between the airway, major vascular structures, cervical spine, spinal cord and digestive tract. Airway management is therefore a major priority, particularly when a foreign body remains embedded in the cervical region.

In these situations, airway management may be complicated by bleeding, tissue distortion, cervical instability, airway injury and the need to avoid manipulation of the penetrating object. Moreover, conventional supine positioning may be

impossible when the foreign body is located posteriorly or when repositioning could increase tissue damage.

Tracheal intubation in the lateral position is technically challenging because the anesthesiologist has limited access to the patient's airway and because conventional laryngoscopy may provide a less favorable view. Videolaryngoscopy may facilitate airway management in this unusual position by providing an indirect view of the glottis. Previous studies have demonstrated the feasibility and advantages of C-MAC videolaryngoscopy for tracheal intubation in the lateral position.

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We report a case of penetrating posterior cervical trauma in a 45-year-old man in whom the presence of a retained foreign body made conventional supine positioning impossible. Successful tracheal intubation was achieved using a C-MAC videolaryngoscope with the patient maintained in the lateral position.

CASE REPORT

A 45-year-old man with no significant known medical or surgical history was admitted to the Trauma Emergency Department of Ibn Rochd University Hospital following an assault.



FIG 1:Initial presentation: penetrating posterior cervical injury with the retained foreign body in situ.

On admission, the patient was **hemodynamically and respiratorily stable**. He was conscious with a Glasgow Coma Scale score of 15/15. Initial clinical examination did not reveal any neurological deficit. Pupils were symmetrical and reactive. There was no reported respiratory distress. Physical examination revealed a **deep penetrating wound of the posterior cervical region with a retained foreign body**.

The object was embedded in the posterior neck and was left in place pending controlled surgical management.

The patient underwent cervical computed tomography with three-dimensional reconstruction. Imaging demonstrated the retained foreign body in the posterior cervical region without evidence of **major vascular injury or spinal cord involvement**. No neurological deficit was identified clinically.

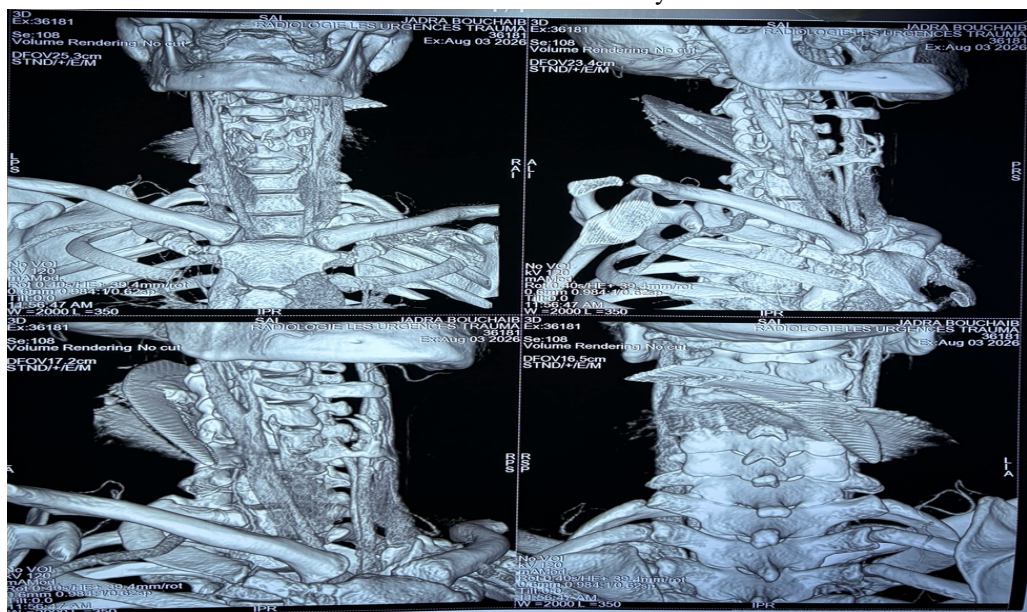


FIG 2 :Cervical CT scan with three-dimensional reconstruction showing the trajectory and position of the retained foreign body.

Given the location of the penetrating object, conventional supine positioning was considered inappropriate because

mobilization of the patient could potentially displace the foreign body and aggravate the cervical injury. The patient

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was therefore maintained in the **lateral decubitus position** for airway management.

Because of the anticipated difficulty of tracheal intubation, a difficult-airway strategy was prepared. Standard monitoring was established and preoxygenation was performed. General anesthesia was induced using **midazolam, propofol and a neuromuscular blocking agent**.

A **C-MAC videolaryngoscope** was selected as the primary airway device. Tracheal intubation was performed with the patient maintained in the lateral position. Two intubation attempts were required to achieve successful tracheal intubation



FIG 3 : Videolaryngoscopic airway management in the lateral decubitus position in a patient with a penetrating posterior cervical injury.

Following successful placement of the endotracheal tube, ventilation was confirmed clinically and by standard monitoring. The tube was secured carefully to prevent displacement during the subsequent surgical procedure.

The surgical team then proceeded with exploration of the posterior cervical wound. The retained foreign body was removed under controlled operative conditions. Surgical exploration was subsequently performed to assess the extent of the injury, followed by placement of a surgical drain.



FIG 4 : Patient positioned prone for surgical exploration of the posterior cervical wound.

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The anesthetic course was uncomplicated. Hemodynamic and respiratory parameters remained stable throughout the procedure. At the end of surgery, after adequate recovery from anesthesia and neuromuscular blockade, the patient was **extubated in the immediate postoperative period**.

No respiratory or neurological complication occurred. The patient did not require postoperative intensive care or prolonged ventilatory support and was transferred for routine postoperative monitoring.

Figure 3. Patient positioned prone for surgical exploration of the posterior cervical wound.

DISCUSSION

Airway management remains one of the most critical components of penetrating neck trauma. The cervical region contains several vital structures within a relatively confined anatomical space, and injury to the airway or vascular structures can rapidly result in life-threatening complications. In the present case, the patient was initially stable from both respiratory and hemodynamic perspectives. Nevertheless, the presence of a retained penetrating object in the posterior cervical region created a major challenge for airway management. The primary difficulty was not an obvious pre-existing anatomical difficult airway, but rather the **impossibility of placing the patient in the conventional supine position without potentially manipulating the injured cervical region**.

In penetrating trauma, unnecessary manipulation of an impaled object should be avoided until appropriate surgical control is available. Consequently, the airway strategy must sometimes be adapted to the patient's position rather than positioning the patient according to conventional airway management principles.

The lateral position is generally considered an unconventional position for tracheal intubation. Access to the patient's mouth and airway is more restricted, and the orientation of the airway relative to the operator is different from that encountered during conventional supine laryngoscopy.

Videolaryngoscopy can be particularly useful in this context. The C-MAC videolaryngoscope combines a Macintosh-type blade with an optical/video system, allowing visualization of the glottis without relying exclusively on direct alignment of the oral, pharyngeal and laryngeal axes.

A randomized study comparing C-MAC videolaryngoscopy with conventional Macintosh laryngoscopy in the lateral position demonstrated a **100% intubation success rate** in the studied population, with a shorter mean intubation time and improved laryngeal visualization with C-MAC. More recent randomized data published in 2026 also confirm that tracheal intubation in the lateral position is feasible in appropriately trained operators, with a high overall success rate.

The usefulness of videolaryngoscopy is not restricted to lateral positioning. In patients with predicted difficult airways, C-MAC has also been associated with a higher first-attempt success rate and better laryngeal visualization compared with conventional direct laryngoscopy.

In our patient, the C-MAC allowed the anesthesia team to obtain indirect visualization of the glottis while maintaining the patient in the lateral position. Although **two attempts were required**, tracheal intubation was ultimately successful without reported airway-related complications.

This case also emphasizes the importance of anticipating failure and preparing an alternative airway strategy. Current difficult-airway recommendations emphasize maximizing first-attempt success, maintaining oxygenation, confirming tracheal placement with waveform capnography when available, and having rescue strategies immediately available if the initial intubation attempt fails.

Another important aspect of this case is the multidisciplinary approach. Management required coordination between emergency physicians, anesthesiologists, surgeons and radiologists. The retained object was not manipulated before adequate airway control and surgical preparation. After intubation, controlled surgical removal, wound exploration and drainage were performed.

The postoperative course was favorable. The absence of vascular or spinal cord injury, combined with stable respiratory and hemodynamic conditions, allowed immediate postoperative extubation without the need for intensive care admission or prolonged mechanical ventilation.

This case illustrates that **lateral-position videolaryngoscopic intubation can represent a valuable rescue or primary strategy when conventional patient positioning is impossible because of traumatic cervical pathology**. However, this technique requires an experienced operator, appropriate preparation and immediate availability of alternative airway devices and emergency front-of-neck access.

CONCLUSION

Penetrating posterior cervical trauma may create an unusual and challenging airway scenario in which conventional supine positioning is contraindicated or technically impossible.

In our patient, successful tracheal intubation was achieved using a **C-MAC videolaryngoscope in the lateral position**, allowing the airway to be secured while avoiding potentially hazardous repositioning of the patient and manipulation of the retained foreign body.

This case highlights the importance of individualized airway planning, videolaryngoscopy, multidisciplinary coordination and preparation for alternative airway strategies in patients with complex penetrating cervical trauma.

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