Case report

Airway management of penetrating neck injury by large foreign body impalement: Report of a case

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1. Background

Airway management with cervical spine protection is the most important first step in management of trauma patients.1 Hence, appropriate airway control is vital in rendering the best possible outcome for patients. However, in selected patients with a difficult airway this may prove to be both complicated and challenging. We present airway management in a patient who sustained penetrating neck injury as a consequence of large foreign body impalement.

2. Case report

A 40-year-old male patient sustained a penetrating transcervical zone II neck injury with an impaled 45 cm long tree branch after falling from his bicycle. The patient was initially evaluated at a rural hospital, and then transferred to our hospital, non-intubated and within 8 h after the accident. Upon arrival at the emergency department, the patient was found conscious, breathing spontaneously and haemodynamically stable (Fig. 1). However, there was some initial concern about the patient’s airway evidenced by both bloody secretions in his mouth as well as, via inspiratory auscultation. Therefore, with the goal of maintaining spontaneous respiration without the use of neuromuscular paralytic agents; we decided to intubate him orally. In the event of failed intubation, preparations were made for a surgical airway procedure. Upon applying a direct laryngoscope, the foreign body was visualized traversing the patient’s hypopharynx just above the laryngeal inlet. Fortunately, we were able to pass a number 8 endotracheal tube (ETT) through the laryngeal inlet, anterior to this foreign body. (Fig. 2). Verification of endotracheal tube position by auscultation, end tidal CO2, and chest X-ray was performed. Subsequently, the patient was taken directly to the operating room for foreign body removal. Broad spectrum antibiotics and tetanus prophylaxis were administered preoperatively. Intraoperatively, penetration by the foreign body was isolated to the hypopharynx without associated vascular injury (Fig. 3). We gently removed the foreign body and repaired two hypopharyngeal wounds with 2-layer absorbable suture. After thoroughly irrigating the wound with normal saline, 2 Penrose drains were placed and skin approximated loosely. The patient was subsequently transferred to an intensive care unit. The ETT was removed on post-operative day 7 with the abatement of airway edema. The patient tolerated oral diet and was discharged without wound complication, thereafter.

Fig. 1. A 40-year-old male patient sustained penetrating transcervical zone II neck injury with an impaled 45 cm long tree branch. Although he was conscious and breathing spontaneously, he had bloody secretion in his mouth and secretion sound upon inspiration.
3. Discussion

Penetrating neck injuries by impaled, large, foreign bodies are very rare. Only few reports have been published, notwithstanding, none of them has mentioned airway management in these patients.\textsuperscript{3,4} The concept of immediate and appropriate airway management is particularly important in patients with penetrating neck injury. Without being properly addressed, bleeding within the tight fascial compartments of the neck can eventually cause airway compromise with oftentimes, catastrophic results.\textsuperscript{3}

Obviously, penetrating neck injuries with a retained large foreign body can cause difficult airway problems. Although this case report was devoid of acute airway obstruction, nonetheless, significant sequelae such as incomplete airway obstruction and difficult intubation remain.

Rapid sequence induction (RSI) using neuromuscular blocking agents are the preferred method of intubation in trauma patients; especially, in the presence of inadequate ventilation.\textsuperscript{10,12} The decision to perform an awake intubation technique without neuromuscular blockade should be chosen with the following criteria in mind: a difficult airway patient who is cooperative, stable, and spontaneously breathing.\textsuperscript{2,13,9,7} Obviously, our patient satisfied this criteria. The primary advantage of awake intubation is maintaining spontaneous ventilation during intubation attempts.\textsuperscript{10,2,13} Awake intubation can be safely performed either by direct laryngoscopy or fiberoptic bronchoscopy; both depending on technical feasibility and judicious anticipation of a difficult intubation. Other experience in our institution was a young male patient with an impaled sword from left temporal bone to the right nostril. The patient was conscious and could breathe spontaneously through his mouth; however, he could not breathe through his nostrils and revealed bloody secretions from his mouth. We successfully performed an awake fiberoptic intubation on him since we were unable to place him in a neutral position.

In regards to management of the "can't intubate, can't ventilate" (CICV) scenario, cricothyroidotomy becomes an important procedure when either oral or nasal intubation has failed.\textsuperscript{5} Recently, Sise et al.\textsuperscript{12} conducted a large retrospective study on 1000 trauma patients requiring a definitive airway procedure. In that study, the rate of cricothyroidotomy in the trauma bay reached 0.7%. The advantage of cricothyroidotomy is its ability to be performed quickly and safely by a trained physician.\textsuperscript{5} With reference to the CICV situation, recent airway guidelines recommend using either percutaneous or surgical cricothyroidotomy.\textsuperscript{2,6,11} In King Chulalongkorn Memorial Hospital, we use a simple indication for cricothyroidotomy, i.e., a difficult airway with CICV situation that fails intubation. The need for cricothyroidotomy was well anticipated in the present study as a backup for awake intubation technique failure. Fortunately, it was not utilized.

In summary, we believe that a definitive airway (i.e., intubation or surgical airway) should be provided to those patients that present with impalement of large neck and facial foreign body. This should be considered prophylactically, even in the absence of acute airway obstruction.
obstruction. In the case of inadequate ventilation, intubation should be quickly performed, either with or without RSI. Awake intubation would be best utilized in stable patients with adequate spontaneous ventilation. Finally, the option of establishing a surgical airway should always be made readily available. This valuable technique should be performed if other options fail or seem impossible.

References