Accidental impalement injury of the right hemithorax: Anaesthetic concerns and challenges

Sir,

Being prepared for emergencies and unanticipated situations in routine clinical practice is very important.[1] Impalement injuries are uncommon injuries resulting from penetration of a solid/hollow organ or body cavity by a blunt object in a through and through fashion, often retained in place on presentation. Accidental impalement injuries to abdomen, chest, limbs and perineum pose complex anaesthetic and surgical challenges due to difficulty in transport and positioning, inadequate time for resuscitation and risk of sudden haemorrhage.[2,3] We report a patient of accidental impalement of the right hemithorax.

An 18-year-old male presented to our trauma centre after colliding with a cart loaded with reinforced iron rods [Figure 1]. Two iron rods 40 feet long had penetrated the right side of his chest in the antero–posterior direction. The rods were then carefully cut to size by the locals for transport. No attempts were made to remove the impaled rods. On arrival, the patient was conscious and oriented with pulse rate of 130 min^{-1}, respiratory rate of 28 min^{-1}, blood pressure of 100/60 mmHg and oxygen saturation of 95%. Immediate resuscitation and sampling for grouping and cross-matching were done. It was not possible to perform head and chest computed tomography (CT) scans. Chest radiographs done with portable machine showed two iron rods penetrating the right hemithorax in the fifth and sixth intercostal spaces sparing the right heart border. The patient was urgently shifted to the operating room (OR) for emergency removal of the rods. During transit, the rods were supported to avoid manipulation. In the OR, rapid sequence induction was done using intravenous thiopentone sodium 125 mg, ketamine 50 mg and succinylcholine 75 mg, and trachea was intubated in the left lateral position with a single lumen endotracheal tube. Left radial artery and right internal jugular vein were

Figure 1: Patient with impalement injury

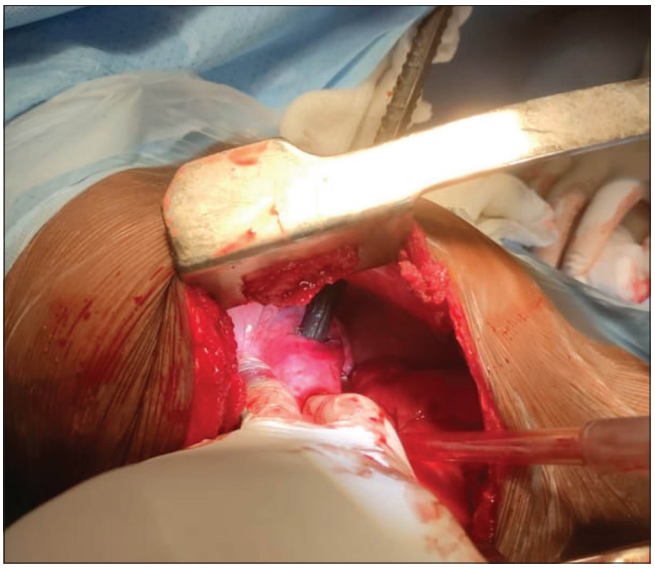

Figure 2: Path of the impaled rod

cannulated for arterial and central venous pressure monitoring, respectively. Anaesthesia was maintained with sevoflurane in oxygen and intermittent boluses of vecuronium bromide and analgesia with intravenous fentanyl. Intraoperatively, the rods were removed by a right postero-lateral thoracotomy and the lung lacerations were repaired [Figure 2]. Blood transfusion was not required. Post operative analgesia was maintained with intravenous paracetamol and fentanyl. Haemostasis and absence of air leaks were ensured. The patient was extubated and the postoperative period was uneventful.

Thoracic impalement injuries have high mortality, but those patients who reach the hospital alive have a good chance of survival. Stabilisation of the impaling object by careful reduction to a manageable size in order to expeditiously transport the patient to a higher centre, as was done in our case, is the mainstay of pre-hospital phase of management. On presentation, immediate resuscitation should be started and minimal investigations should be ordered to reduce the time to shift to OR. CT scan can guide the surgical approach and is obtained, if the patient is haemodynamically stable and negotiable into the CT console. The trajectory of the impaled object, if assessed can indicate the likely structures involved.[4,5] In our case, the impaled rods had an antero–posterior trajectory which is the least favourable for positioning. Different alternates for positioning have been proposed such as arranging two parallel tables or utilising the gap between the theatre table attachments to place the projecting rod in between. Other options are semi-reclining, sitting and left lateral positions.[6] We chose the latter, as it was easiest to implement and proved to be time efficient being the final surgical position. Nevertheless, successful planned intubation in the lateral position has been reported in several cases of an anticipated difficult airway.[7] In our case, a single lumen tube was preferred owing to the lateral position. A switch to double lumen tube might be necessitated by a change in the surgical course. Preparedness for massive transfusion is pivotal due to the risk of sudden haemorrhage.

To conclude, the outcome of a thoracic impalement injury is considerably dependent upon the pre-hospital course and time to surgery. Optimal positioning for airway and haemodynamic management are the major anaesthetic challenges.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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