Airway management in prone position following penetrating iron rod injury in back: An anaesthetic challenge

A 20-year-old male was impaled by the iron rod piercing the gluteal region and coming out diagonally when he fell from height while working at an under-construction two-storey building [Figure 1]. In view of suspected spinal injury, the patient was transferred on a 'spine board' in the prone position. On examination, vitals were within normal limits with peripheral oxygen saturation (SpO_2) of 98%. Cervical spine injury was ruled out by computerised tomography (CT) scan, conducted in prone position. Exact position of the iron rod was marked on the CT scan, as shown in Figure 2 (iron rod was shown to be entering the gluteal region and coming out diagonally).

He was medically optimised in prone position in the preoperative area, with two wide bore cannulae and intravenous fluids. Injection morphine 6 mg intravenous (IV) was given slowly to provide pain relief. The plan of anaesthetic management included ventilation and tracheal intubation using i-gel®, a supraglottic device under general anaesthesia in prone position with backup plan of fibreoptic intubation. The patient was pre-oxygenated with 100% oxygen for 3 min with his head placed in headrest rotated to lateral side in prone position. Immobilisation of spine was achieved at all time points. Para-oxygenation was done with nasal prongs attached to both the nostrils with oxygen flow at 2 L/min. Induction of anaesthesia was done with IV fentanyl (2 μg/kg) and propofol in titrated doses, confirming adequate mask ventilation and maintaining on 100% O_2 and sevoflurane 2–3%. After achieving adequate depth of anaesthesia by holding the mask in prone position, lower jaw was pulled down in extended position with the help of an assistant and number 4 i-gel® was introduced and secured after checking ventilation with adequate chest rise and capnograph. After confirming adequate ventilation, 7 mm cuffed endotracheal tube (ETT) was blindly passed through the i-gel® successfully with limited manipulation in the very first attempt. Intubation was confirmed with bilateral chest rise, auscultation, and capnography; hence, thereafter the i-gel® was removed and the ETT fixed in place. Muscle relaxation was achieved with IV vecuronium 0.1 mg/kg, and maintenance of anaesthesia was done with 66% nitrous oxide in oxygen and sevoflurane. The iron rod was removed by the surgeons with an intra-operative blood loss of 400 ml. The trachea was extubated successfully when the patient was fully awake in supine position on transfer table with no residual neuromuscular block.

Airway management in prone position poses many problems, as it is not a usual position for airway management. Options for airway management in prone position are direct laryngoscopy and oral intubation, blind nasal intubation, awake fibreoptic intubation and intubation using supraglottic device.[1-4] Direct laryngoscopy and oral intubation under vision can be done in prone position but it poses a lot of challenges which include difficult position for airway manipulation, limited time and limited attempts in difficult position for operator, risk of failed intubation, and operator assistance for positioning the patient.[1] In

Figure 1: Patient was lying face down with a 50-cm-long iron rod piercing the gluteal region and coming out diagonally

Figure 2: Exact position of the iron rod was marked on CT (iron rod was shown to be entering the gluteal region and coming out diagonally)

our patient, difficult position and emergency situation lead us not to choose this option.

Blind nasal intubation (BNI) can be taken as an alternative to secure airway in prone position, but it requires fully relaxed patient using deep sedation and muscle relaxant, operator assistance, experience in doing BNI and high level of skill required for operator. Limited time, emergent situation, difficult to manipulate airway lead us to other options. Awake fibreoptic intubation is a good alternative to secure airway in prone position but it requires superior skill to intubate with fibreoptic in prone position. Device availability, patient consent, proper airway preparation using airway nerve blocks or topical anaesthesia by nebulization or local spray of local anaesthetic agent, operator assistance, lots of patient co-operation are required in such a case. In our patient, consent for awake fiberoptic intubation was a major issue.[3]

Intubation using i-gel® LMA is better in the view of patient position, ease of insertion, better patient co-operation, less need of airway manipulation, and providing a conduit for ventilation. We also preferred i-gel® to other available supraglottic airways like the Intubating Laryngeal Mask Airway (LMA fastrach) as we are routinely using i-gel® over other supraglottic airway devices and having better learning curve over other with higher success rate of insertion.[4] By this case management, we conclude that in cases where the patient must remain in the prone position, endotracheal intubation through an i-gel® or other supraglottic device is possible and provides multiple advantages over other techniques.

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 his identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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