Sir,

Intubation in prone position is a very challenging procedure. In most of the cases, intubation is prone position is described in emergency scenarios and during surgery in prone position.\[1,2\]

Here, we describe a case report of a patient who presented to our institute with an impaled knife at the level of D5 vertebrae. In this patient, the knife was positioned very close to the vital structures that warranted us to intubate her in prone position. We used an intubating laryngeal mask airway (ILMA, LMA-Fastrach™; The Laryngeal Mask Company Ltd, Bucks, UK) to facilitate intubation using fiberoptic bronchoscope (FOB, Olympus BF Type P30; Olympus, Lake Success, NY, USA).

A 23-year-old female patient presented to the emergency department with an alleged history of stab injury (with knife in situ) on her back [Figure 1]. The patient was lying in prone position since the time of assault as the knife was protruding out of her back, thus, she was immediately immobilized on a hard trolley in the same position. The patient was conscious, oriented to time, place and person but anxious. On examination, we observed motor weakness in bilateral lower limbs (0/5 in the left lower limb and 3/5 in the right lower limbs). She was hemodynamically stable with a heart rate of 65 beats/min, blood pressure of 116/50 mmHg, respiratory rate of 20–25/min, and room air saturation of 98%. There were no clinical signs of respiratory distress and injury to lungs or other mediastinal structures. There was no history of associated other injuries such as head trauma, abdominal trauma, and long bone injuries. Investigations revealed normal biochemical and hematological profile. Chest radiograph showed a deeply penetrating weapon. On computed tomography, knife was seen entering from the back between T4 and T5 intervertebral disc space, traversing through the spinal cord with the tip of knife just abutting the posterior wall of trachea but an intact intervening fat plane [Figure 1]. Esophagus was shifted towards the right and no injury detected. Rest of the mediastinal structures was intact.

As the knife was penetrating deeply and lying quite closer to various vital structures, it was decided to surgically explore and remove the knife under general anesthesia without repositioning the patient because even the slight movement of knife might have led to the disaster. We planned to intubate her in prone position using FOB through the ILMA (Plan-A). If the first attempt would have failed, then we planned to proceed with either FOB alone (Plan-B) or using video laryngoscope (Plan-C). If anytime during the procedure, we would have lost the airway then plan was to either wake up the patient and tried awake intubation (Plan-D) or intubation in lateral position (E) would have been attempted. After keeping all these plans in mind, we proceeded with our first plan that is intubation using FOB through ILMA. Standard monitors were attached including electrocardiogram, noninvasive blood pressure, and pulse oximetry. After confirming the patency of intravenous cannula, fluid was infused to hydrate the patient. Patient’s head was turned to one side and supported with head ring. Mouth opening was adequate, and there was no obvious airway anomaly. She was preoxygenated with 100% oxygen for 5 min and then induced with propofol and thereafter maintained on continuous propofol infusion. Mask ventilation was possible, but we planned to avoid muscle relaxant to keep the patient on spontaneous ventilation as there was no obvious airway anomaly. She was preoxygenated with 100% oxygen for 5 min and then induced with propofol and thereafter maintained on continuous propofol infusion. Mask ventilation was possible, but we planned to avoid muscle relaxant to keep the patient on spontaneous ventilation as there was a risk of losing the airway in case of failed intubation. After deepening the plane of anesthesia patient was intubated with size-4 ILMA and ventilation was confirmed. FOB was passed through the ILMA and tip of the FOB was passed along the side of the elevator bar to prevent injury to the scope. The trachea was intubated with 7.5 mm internal diameter cuffed endotracheal tube (ETT) under direct vision through FOB in the first attempt.

There was no episode of desaturation or any other airway complications. After checking for the bilateral air entry, ILMA and tip of the FOB was passed along the side of the elevator bar to prevent injury to the scope. The trachea was intubated with 7.5 mm internal diameter cuffed endotracheal tube (ETT) under direct vision through FOB in the first attempt.

Figure 1: (a) Computed tomography imaging of the thorax of the patient showing the direction of the knife entering the thorax. (b) Sagittal view showing knife abutting the posterior wall of trachea. (c) Axial view showing the tip of knife abutting the posterior tracheal wall and displacing esophagus laterally. (d) Intubating laryngeal mask airway showing tip of fibreoptic bronchoscope emerging through the side of epiglottis elevator bar

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bolus and propofol infusion. The knife was removed after removing the spinous process under direct vision without any complications. At the end of procedure neuromuscular blocking was reversed with neostigmine and glycopyrrolate, and trachea was extubated after regaining consciousness. In the immediate postoperative period, muscle strength was same as a preoperative period, but it recovered after postoperative day (2/5 left lower limb and 3/5 right lower limb). There were no further complications during hospital stay and patient was discharged on postoperative day-5 with lower limb muscle strength of 3/5 in left lower limb and 4/5 in right lower limb.

This is the first case report where the patient with an impaled knife on the back of chest was intubated in prone position via ILMA using FOB. There are various case reports describing the similar case scenarios, where intubation was done in lateral,[4] supine[5] or prone position,[6] using FOB in awake patient[5] or ILMA.[6] The supine position was managed by placing the patient’s chest in between two trolleys, whereby one trolley was placed below the head, and upper chest and lower body were placed on another trolley.[6] These techniques of intubation in lateral or supine position with an impaled knife were associated with gross movements of patient’s body and can cause inadvertent movement of the stab. We avoided such positions as the tip of the knife were lying very close to the vital structures, and even slight movement could have resulted in disastrous consequences. Awake FOB intubation needs patient’s cooperation which was not possible in this scenario. Another option could have been the blind tracheal intubation through ILMA which has also been previously reported.[5] The advantages of intubation through ILMA include minimal neck movement during intubation and the possibility to ventilate the patient even if the intubation fails. The disadvantages of blind intubation through ILMA are arytenoid trauma and the risk of esophageal intubation. However, these limitations can be easily overcome using FOB.

The FOB and ILMA act synergistically when used together. ILMA provides a well-formed conduit for the FOB which is free of secretions, blood and other obstacles otherwise commonly seen in trauma settings and obscuring the view of the FOB causing failure or prolonged intubation. ILMA malposition or folding can also be easily diagnosed using FOB which can then be corrected under the vision of FOB. The vocal cords are well visualized using this technique which further minimizes the risk of esophageal intubation. FOB as a sole tool for intubation needs expertise and may be difficult in prone position. This technique might fail in the presence of secretions and blood in the airway. Furthermore, ventilation is not possible during FOB, and might leads to desaturation during intubation attempts.

Thus, the technique of intubation with ILMA-guided FOB is safer, faster and has a lower failure rates. We suggest that ILMA is a useful adjunct to FOB and facilitates intubations in difficult scenario such as intubation in prone position.

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Conflicts of interest
There are no conflicts of interest.

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