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Case Report

Endotracheal Intubation for Penetrating Neck Trauma

Abstract

Tracheal intubation is performed as part of daily routine in the operating room, rarely with complications. However, management of airway for cases such as a penetrating neck trauma case might constitute exceptions, in which cases the stabilization of the neck to prevent any further neural damage is a significant source of concern for the anesthesiologist. Generally, intubation techniques for penetrating neck trauma were planned according to the initial position of patients. To our knowledge, this is the first case report of alterated the position of the patient during the anesthesia induction for direct laryngoscopy. We report a case of successful airway management of a patient with penetrating neck trauma, by endotracheal intubation with direct laryngoscopy (DL) technique.

Keywords: *Direct laryngoscopy, general anesthesia, neck trauma*

Sevtap Hekimoglu Sahin, Beyhan Karamanlioglu, Mehmet Turan Ina, Huseyin Ugur, Tolgay Akıncı[1], Hakan Tagrikulu, Banu Tutunculer[1]

Departments of Anaesthesiology and Reanimation and [1]Neurosurgery, Trakya University Medical Faculty, Edirne, Turkey

Introduction

Traumatic injuries of the neck region are rare, although they are big challenges for the anesthesiologist for the management of airway and for the induction of anesthesia to prevent mortality and morbidity. With sharp objects remaining in head or neck wound, tracheal intubation may be difficult due to the fact that any dislocation may cause further neurological deficits or sudden death. Therefore, a critical decision must be made either to continue in a suboptimal position which may lead to difficulties or to change the position of the patient taking the mentioned risks. A careful planning according to the basic principles of intubation may lead to safer results.

Management of airway for cases with suboptimal lateral decubitus (left or right) or prone positions are reported.[1-3] However, to the best of our knowledge, a case of airway management with direct laryngoscopy (DL) technique while the head of the patient was also held by the anesthesiologist for stabilization has not been reported. We present a case of penetrating neck trauma in which the DL technique was used to secure the airway while the head of the patient was also held by an anesthesiologist.

Case Report

A 44-year-old male patient was taken to the Intensive Care Unit from the Emergency Department with a history of suicidal stabbing wound in the scruff region for observation until surgical intervention. A 7 cm long, single-edged blade, penetrated next to the sagittal midline at occipitocervical junction was remaining inside the wound [Figures 1 and 2]. The patient was conscious, cooperative, and breathing spontaneously. Arterial blood pressure (BP) was 142/71 mmHg, heart rate (HR) was 70 beats/min, respiratory rate was 25–30/min, and oxygen saturation (SpO_2) with no oxygen supply was 98%.

The computed tomography revealed that the blade had penetrated between the occipital bone and the posterior arcus of atlas that the edged side was laterally located endangering the vertebral artery and that the tip of the blade had reached intracranial region through the foramen magnum [Figures 3 and 4]. The neurological examination at admission revealed a Glasgow Coma Scale score of 15. The pupils were isochoric, both reactive to the light. The physical examination exposed a −4/5 hemiparesis and hypoesthesia at the right side. The patient was not taking any medication, had an unremarkable medical record and had no history of alcohol abuse.

The patient was put on oxygen mask (flow 10 L/min) and transferred to the operating room to remove the knife by surgical exploration. Written informed consent from patients' parents was obtained for this study. He was monitored with the measurements

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Address for correspondence:
Prof. Sevtap Hekimoglu Sahin, Department of Anaesthesiology and Reanimation, Trakya University Medical Faculty, Edirne, Turkey.
E-mail: sevtaphekimoglu@mynet.com

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Figure 1: When viewed from above, patient in the prone position, with the knife lodged in the neck region

Figure 2: When viewed from the side, patient in the prone position, with the knife lodged in the neck region

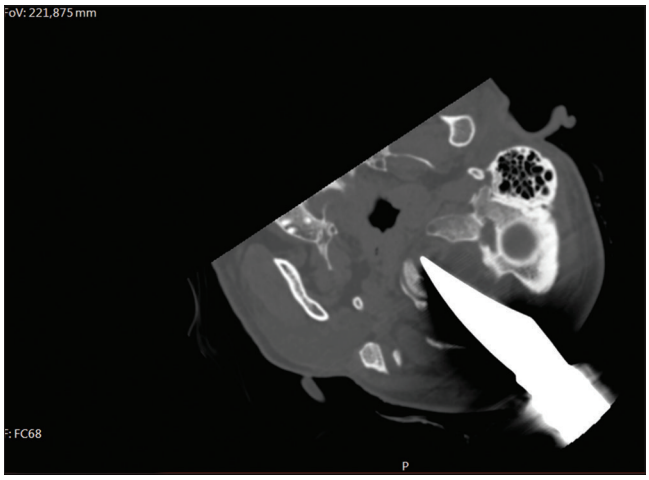

Figure 3: The computed tomography showed that the blade had penetrated between the occipital bone and the posterior arcus of atlas, that the edged side was laterally located endangering the vertebral artery and that the tip of the blade had reached intracranial region through the foramen magnum

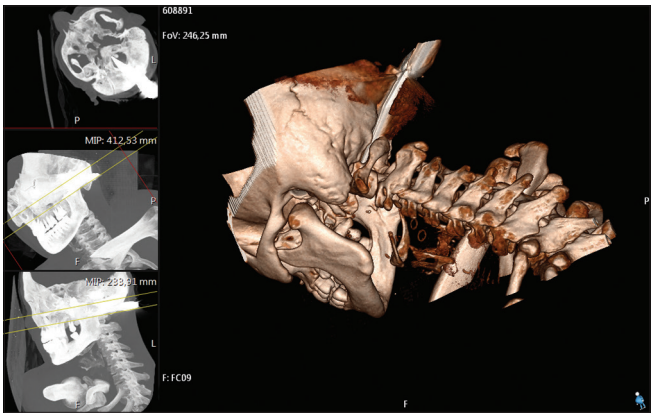

Figure 4: Preoperative computed tomography showed the knife has entered the region between the occipital bone and the C1 lamina, and the tip of the blade has extended up foramen magnum

of peripheral SpO_2, electrocardiograms (leads II, V1), cutaneous temperature (T), and invasive BP assessments (right radial artery) in the operating room. His HR (100 beats/min), BP (120/55 mmHg), and body temperature (36.6°C) were also recorded. As it was impossible to perform intubation securely in lateral position, the patient was carried to the proximal part of the operating table. In this position, with head and shoulder held and suspended in air, anesthesia was induced intravenously with the dosages of 1 μg/kg, 2.5 mg/kg, and 0.6 mg/kg of fentanyl, propofol, and rocuronium, respectively. After the induction, the patient was turned into supine position. While the assisting anesthesiologist was holding down the occiput and thus preventing any head movement with hands placed on each side of the head; another had ventilated the patient with balloon and then performed intubation. During the maneuvers and the laryngoscopy, the hyperextension and excessive axial traction of the neck are avoided by manual immobilization of the head and neck by an assistant. The patient was turned back to the prone position and head fixed by horseshoe head holder after intubation.

Maintenance was achieved using sevoflurane 1 minimum alveolar concentration in a 50:50 air:oxygen ratio. After the exploration of the wound by the midline skin incision, suboccipital craniectomy, C1 laminectomy, and dorsal midline durotomy, no any injury on the spinal cord and the vertebral artery has occurred and the blade removed. No respiratory or hemodynamic problems occurred during the surgery. The patient was taken to the Intensive Care Unit and was extubated there within an hour. His postoperative period was uneventful. Neurological impairment was not seen. One day later, he was sent to neurosurgery service under a good general condition, and he was admitted to psychiatry service 4 days later.

Discussion

The different techniques for airway management in the unsuitable position for intubation are awake fiber-optic intubation, DL, endotracheal intubation (ETI), and the

intubating laryngeal mask airway.[1-5] The unsuitable position for intubating may be a variety. Right and left lateral and prone position are some of these positions.[6,7]

The lateral position is not a general position for ETI and anesthesia induction because this position can cause difficult mask ventilation and tracheal damage by DL.[3] Anesthetists' might encounter problems with accidental loss of airway security and inadequate regional anesthesia requiring general anesthesia in the lateral position during surgery. However, many experienced anesthetists' may be unfamiliar with tracheal intubation in the lateral position. McCaul *et al*.[8] reported that the left lateral decubitus position cause of deterioration in laryngoscopic imaging conditions, difficult ETI, and an increased incidence of intubation failure. Moreover, another study which Baer and Nyström[7] investigated the outcome of 247 cases of prone intubation. They reported that tracheal intubation in the prone position may be routine performed by continuous training and effective support from the anesthesiology staff. However, anesthetic management of trauma patients presenting with penetrating occiput and scruff injury requires airway securement and induction and intubation of anesthesia in lateral or prone position to avoid further neurological deficits. In such a case, awake fiber-optic intubation should be considered. Awake fiber-optic for tracheal intubation is considered as gold standard in lateral or prone position.[1,6] However, the related complications of awake fiber-optic intubation can occur in patients such as patient movement, over sedation, failure, time-consuming, hypotension, and hypertension. Awake fiber-optic for tracheal intubation requires the patient's cooperation, experience, and special equipment. In such situations, the method in which the anesthesiologist is best and experienced might play a major role. Although there were very few case reports to awake fiber-optic intubation used to difficult airway management, no data to suggest better outcomes with any particular technique. We did not choose this method of airway management because our experience is limited to patients in the supine position. In addition to the inability of the patient to cooperate; therefore, we applied the DL in which we are most experienced by positioning the patient in the appropriate position for intubation.

DL was our first choice. However, we were prepared for the case of "cannot intubate cannot ventilate," and different techniques such as video laryngoscope, fiberscopes or airway scope, and intubating laryngeal mask before anesthetic induction. We believe that such an equipment possibly by additional support by hands of an assistant, would have offered more reliable stability of the neck than manual holds alone.

Intubation techniques for similar cases were planned according to the initial position of patients; however, for this case, we have alterated the position of the patient during the anesthesia induction for DL that is the optimum intubation technique on which we had the maximum experience.[7-9]

Conclusion

In case of difficult intubation, we think that the technique on which the anesthetist has the most experience is the safest and the one with maximum chance of success rather than the newest or oldest technique.

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Conflicts of interest

There are no conflicts of interest.

References

1. Ng A, Raitt DG, Smith G. Induction of anesthesia and insertion of a laryngeal mask airway in the prone position for minor surgery. Anesth Analg 2002;94:1194-8.
2. Lipp M, Mihaljevic V, Jakob H, Mildenberger P, Rudig L, Dick W. Fiberoptic intubation in the prone position. Anesthesia in a thoraco-abdominal knife stab wound. Anaesthesist 1993;42:305-8.
3. Samantaray A. Tracheal intubation in the prone position with an intubating laryngeal mask airway following posterior spine impaled knife injury. Saudi J Anaesth 2011;5:329-31.
4. Brimacombe JR, Wenzel V, Keller C. The proseal laryngeal mask airway in prone patients: A retrospective audit of 245 patients. Anaesth Intensive Care 2007;35:222-5.
5. Agrawal S, Sharma JP, Jindal P, Sharma UC, Rajan M. Airway management in prone position with an intubating laryngeal mask airway. J Clin Anesth 2007;19:293-5.
6. Valero R, Serrano S, Adalia R, Tercero J, Blasi A, Sánchez-Etayo G, *et al.* Anesthetic management of a patient in prone position with a drill bit penetrating the spinal canal at C1-C2, using a laryngeal mask. Anesth Analg 2004;98:1447-50.
7. Baer K, Nyström B. Routine intubation in the prone position. Ups J Med Sci 2012;117:411-4.
8. McCaul CL, Harney D, Ryan M, Moran C, Kavanagh BP, Boylan JF. Airway management in the lateral position: A randomized controlled trial. Anesth Analg 2005;101:1221-5.
9. Xue FS, Liao X, Wang Q, Yuan YJ, Xiong J, Liu JH. Comparison of tracheal intubation with the airway scope and macintosh laryngoscope in the lateral position. Eur J Anaesthesiol 2011;28:464-5.