Special Feature: "Short Communication"

Positioning of a patient with scoliotic spine deformity for induction of anaesthesia

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ABSTRACT

Positioning of a patient with irregular contour of spinal curvature is a common problem faced by anaesthesiologists for surgical procedures. Here we would like to describe how to use routine materials available in the operating room efficiently to accomplish successful endotracheal intubation.

Key words: *Positioning, Endotracheal intubation, Mattresses*

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INTRODUCTION

Positioning for induction of anaesthesia is a common problem faced by anaesthesiologists for certain surgical procedures and scoliosis is one of them. Patients with scoliotic deformity over dorsal spine may pose a problem while positioning the patient in supine because of the irregular contour of the spinal curvature. Various techniques have been described for successful airway management in prone position includes, awake fibreoptic bronchoscopy (FOB), intubating laryngeal mask airway (ILMA) and direct laryngoscopy. Here we would like to describe how to use routine materials available in the operating room (OR) efficiently to accomplish successful endotracheal intubation.

A ten-year-old male child weighing 18 kg with scoliotic deformity of thoracic spine who was operated six months back, is now posted for implant removal as extrusion of the implant had occurred. On detailed anaesthetic evaluation, child is quiet and co-operative and belonged to American society of Anesthesiologists physical status I. [1]Spine examination revealed that, child was having thoracic scoliosis with the projection of implant from the previous incision site (Figure 1). Other relevant laboratory investigations were within normal limits. After thorough pre-anaesthetic evaluation, the child was considered for implant removal in prone position under general endotracheal anaesthesia (GETA). He was kept in fasting (6 hours for solids and 2 hours for clear liquids) before the scheduled procedure.

On the day of surgery, before shifting the child to the theatre we prepared the OR table in such a way that the child can be positioned over the soft mattress and the deformity will be positioned in between the mattress and the child can lie-down comfortably in supine position. We managed to obtain two foam mattress and a soft pillow and laid down them on the OR table. The patient was shifted onto the OR table with the help of four assistants in supine position and the mattress and pillow were

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Figure 1: Spinal deformity with projection of implant from previous surgical incision site (white arrow)

positioned in such a fashion that none of the protruding parts of the scoliotic rod comes in contact with any part of the OR table or mattress (Figure 2). Child was induced with inhalational anaesthesia using sevoflurane up to 8% in 100% oxygen. After that, intravenous (IV) line was secured using 20G IV cannula and was

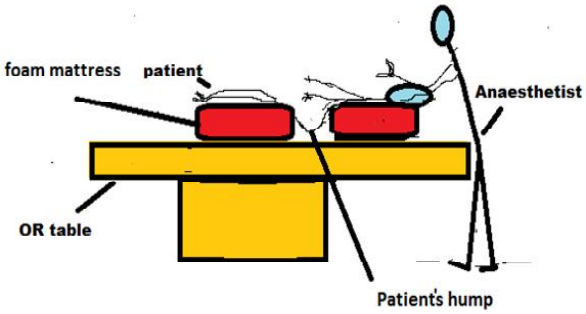

Figure 2: Position of the patient during intubation

intubated with 5.5 mm cuffed endo tracheal tube with the help of vecuronium (2 mg IV). Electrocardiogram (ECG), non-invasive blood pressure (NIBP), end-tidal carbon dioxide ($ETCO_{2)}$, pulse oximetry, temperature and urine output were monitored. Maintenance of anaesthesia was done by using oxygen and air (50:50), sevoflurane 2%-3% with intermittent positive pressure ventilation (IPPV). Analgesia was provided with 2 mg of IV morphine and 300 mg of IV paracetamol. IV fluids were infused as per the child requirements according to the fasting hours and the intra operative blood loss. Implant was removed and the blood loss was around 200 mL which was replaced with 150 mL of packed red cells. Child had stable haemodynamics throughout the procedure.

At the end of procedure, which lasted about 2 hours child was turned back to supine position in a similar way as during intubation. Anaesthesia was reversed with IV neostigmine (1 mg) and glycopyrrolate (0.2 mg) and the patient was extubated after attaining protective airway reflexes. Child had uneventful recovery was discharged from the hospital.

The conventional anaesthetic management of patients undergoing elective surgery in the prone position usually starts with a standard induction of general anaesthesia and endotracheal intubation in the supine position, with the patient subsequently being turned onto the prone position. Patients with abnormal spine curvature with protruding implant may encounter a problem while positioning a patient supine as in our case. Such cases may be difficult to position them in supine for induction and intubation. Our patient used to lie down regularly in the lateral or prone position while sleeping or taking rest at his house to avoid pain and discomfort associated with abnormal scoliotic spine curvature and protruding implant from previous surgical site.

After thorough preoperative evaluation, the child was considered for elective implant

removal in prone position. Our plan was to administer GETA. Various techniques that were available to us to secure the airway in this child are awake fibreoptic intubation in sitting position, direct laryngoscopy (DL) and intubation or laryngeal mask airway (LMA) insertion in prone position.

Although we are regularly practicing awake fibreoptic intubation in difficult airway management scenario, our experience is limited to patients in the supine position. We did not choose this method of airway management because of lack of expertise in other positions and unwillingness of the child to be awake while his airway was being manipulated.

Other options left with us for securing the airway in prone position was either by LMA or direct laryngoscopy (DL) and intubation. In other case reports[2,3] they successfully secured the airway in prone position by using LMA. In another case report[4] patient was intubated in prone position by using intubating LMA. Van zundert et al[5] reported that they had secured the airway by direct laryngoscopy and endotracheal intubation in the prone position following traumatic thoracic spine injury. In all these case reports[2-5] patients had non-missile sharp object penetrating in to the spine and most of these cases were operated on emergency basis.

Our patient had scoliotic deformity for which he was operated one year back and presently he was admitted with uncorrected deformity with protruding implant from the previous incision site and was posted for implant removal. We decided to intubate the child in supine position. We have not opted for prone intubation because; we were not familiar with prone intubation techniques. In a case report[6] intubation was achieved in their case by using suspended supine position. In our case we arranged foam mattresses and prepared the OR table in such a way that the child could be positioned over the mattress, the deformity would be positioned in between the mattress, and the child can lie-down comfortably in supine position (Figure 2). This technique is almost similar to those used by Rabiu et al[6] but in our case we have used the foam mattresses which are available to us in the theatre.

Based on our experience in the current case we are of the opinion that, simple routinely available materials (like foam mattress) can be used efficiently to obtain a direct laryngoscopic view in supine position for a successful tracheal intubation.

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