Dealing with a neonate with esophageal atresia (EA) and a distal tracheoesophageal fistula (TEF) is a genuine anesthetic challenge, and even the most skilled anesthesiologist may face challenges to place an endotracheal tube (ETT) accurately, beyond the fistula to avoid stomach distention while the fistula is being surgically repaired, in such patients. Incorrect placement of ETT can have life-threatening consequences if not handled correctly. ETT migration in the fistula can result in increased morbidity due to inadequate ventilation, stomach distension, increased intra-abdominal pressure, impaired hemodynamics, reduced venous return, and impede diaphragmatic excursion, resulting in significant morbidity and respiratory embarrassment in an already distressed neonate. Another concern that necessitates careful ETT placement is aspiration pneumonitis caused by contents of the stomach being aspirated through the TEF because of gastric distension. There is a lack of literature that describes the role of point-of-care ultrasonography (POC-USG) for accurate ETT positioning.

A two-day-old newborn baby weighing 3.2 kg with complaints of regurgitation of feeds, drooling of saliva, and respiratory distress since birth and diagnosed with type C TEF (identified clinically and corroborated by chest X-ray images), was scheduled for thoracoscopic TEF repair. In the neonatal intensive care unit (NICU), the patient was kept on oxygen at a rate of 6 L/min with a hood. The neonate was taken to a preheated operation theatre on the day of surgery, and all standard monitors were attached. Glycopyrrolate was given as premedication, and the neonate was induced with fentanyl and ketamine, O2 + Air (50%) and sevoflurane, kept on spontaneous respiration. Ultrasound abdomen in the operating room was conducted by an experienced anesthesiologist using a Sonosite EDGE II Ultrasound System, using a curvilinear probe (2–5 MHz). We used POC-USG to constantly monitor the air in the stomach prior to intubation, and the measurement before induction was 0.84 × 0.5 cm in length and breadth [Figure 1]. Initial right endobronchial intubation was achieved at 12.5 cm and hence tube was withdrawn to succeed endotracheal intubation at 12 cm with an uncuffed ETT size 3 under direct laryngoscopy using a #0 Miller blade; manual ventilation was initiated with gentle positive pressure ventilation with no air intrusion in the stomach, and confirming bilateral air entry in the lungs and no air in the stomach on auscultation. We gradually withdrew the ETT by 0.5 cm at a time, and by real-time ultrasonography assessment, we could see stomach distension to the size of 2.04 cm × 1.62 cm at the 11-cm mark of the ETT [Figure 2]. Air entry was also equal on both sides, but there was air entry in the gastric area on auscultation at the 11-cm mark. Therefore, the ETT was pushed back until it reached the 12-cm mark, after ensuring bilateral lung entry and ensuring no further change in stomach dimension with a POC-USG stomach and auscultation in the gastric area. We observed the parameters of assessing stomach diameter until the patient was positioned laterally, and confirmation was done again to ensure that the ETT had not migrated while positioning. A gross type C TEF was revealed during a simple thoracotomy repair (Vogt IIIb). The patient was kept on spontaneous ventilation during the thoracotomy repair. Following the repair of the tracheal end of the fistula, Inj. Atracurium 0.5 mg/kg was administered, and mechanical ventilation was initiated. After surgery, the patient was not reversed because of poor preoperative general condition and was transferred to the surgical NICU for postoperative care.

During surgery, managing a neonate with EA and a distal TEF is a true anesthetic challenge. The placement of an endotracheal tube is aided by inserting the tube as far as possible and gradually withdrawing it until bilateral equal breath sounds are heard. We used inhalation induction with spontaneous breathing to optimize airway management, to avoid any distension secondary to mask ventilation. If awake intubation is planned, adequate ventilation without stomach distension should always be established before the administration of general anesthesia. Ineffective ventilation of the TEF can result in stomach distention or rupture, hypotension, or gastric reflux. Exact endotracheal tube insertion necessitates a combination of techniques that vary depending on the patient’s underlying medical issues, the
extent of the fistula, and other factors. There are several methods for confirming the ETT position concerning TEF. A traditional way is to auscultate the bilateral lung fields and stomach. Neonatal fiber optic bronchoscopy with or without blocking the fistula is also an option, but it is difficult to perform at this age, and availability and expertise are issues.\(^1\) If there is a gastrostomy in place, we can confirm the position of the ETT by observing bubbling through the gastrostomy tube, which should not be present during ventilation. The proposed use of real-time POC-USG for correct ETT placement and positioning can reduce the complications and morbidity associated with TEF patients’ airway management. Even if the ETT is correctly positioned, it may still migrate into a fistula, which frequently occurs when the patient is positioned for a thoracotomy or thoracoscopic repair. Thus, we ensured real-time assessment via USG until the patient was positioned laterally. In their case report, Alabbad SI et al.\(^2\) reported that after positioning for a thoracotomy, the patient became desaturated and bradycardic, with abdominal distention. At autopsy, the endotracheal tube’s distal end was discovered to have migrated through a distal TEF.

To avoid or reduce gastric insufflation, a combination of careful ETT positioning, withdrawal, and repositioning via real-time ultrasound stomach evaluation until the patient is positioned for surgery is recommended for TEF repair in neonates.

**Declaration of patient consent**

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

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There are no conflicts of interest.

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