



SAFE (Secure Airway Fetal Endoscopy) technique: an advanced protocol for managing fetuses with complex airway conditions



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Introduction

Advanced fetal airway management is crucial in congenital anomalies with risk of airway obstruction at birth. Cervical tumors, though rare, can compromise the airway. Ultrasound and MRI enable early prediction of difficult intubation. While EXIT ensures controlled access, we propose a complementary technique that improves airway visualization, reduces intubation failure, and may prevent additional interventions.

Objective

To present the SAFE technique as an innovative strategy for fetal airway management during an EXIT procedure in a case of cervical mass with severe tracheoesophageal displacement.

Case description

A 35-year-old patient at 23+3 weeks was referred with a vascularized cervical mass and right fetal hydrothorax causing mediastinal shift. A thoracoamniotic shunt resolved the condition, but at 27 weeks, left-sided hydrothorax required a second shunt. The mass grew rapidly (523 cc). MRI showed TEDI >12. At 32 weeks, preterm labor led to an EXIT procedure using the SAFE technique for airway management.

Conclusion

The SAFE technique offers a reproducible and effective approach to fetal airway management during EXIT in cases of complex cervical masses. By enhancing direct visualization and anatomical orientation, it may improve intubation success, reduce the need for additional procedures, and support safer perinatal outcomes.

SAFE technique – key steps

- Fetal upper thorax delivered during EXIT for airway access.
- Tongue gently displaced digitally to expose oropharyngeal inlet.
- A 3 mm curved rigid fetoscope with 1.2 mm camera was preloaded into a neonatal orotracheal tube (3.5 mm OD, 2.0 mm ID, 18 cm).
- Assembly inserted orally and advanced through oropharynx.
- Key landmarks identified: uvula, oropharynx, epiglottis, arytenoids, vocal cords.
- Once airway confirmed, tube gently advanced under direct vision.
- Correct intratracheal placement verified and tube secured.

Discussion

Prenatal evaluation of fetal neck masses is essential for predicting airway obstruction. Ultrasound and MRI, combined with tools like TEDI, enable early risk assessment and guide delivery planning. Although EXIT provides airway access, neonatal laryngoscopy may be insufficient. The SAFE technique enhances visualization and control, supporting a more effective and integrated strategy for fetal airway management in complex cases

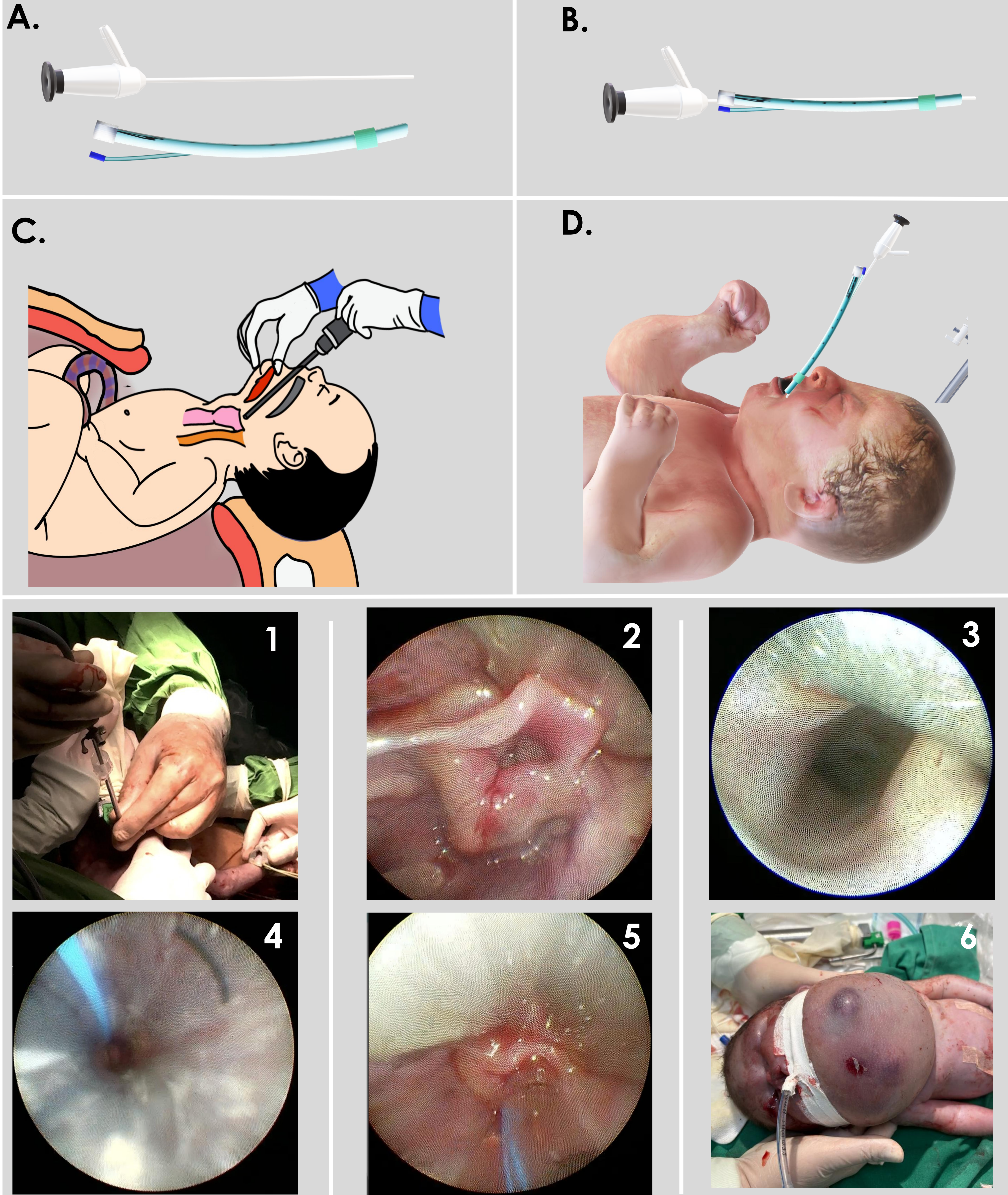


Figure A-B: SAFE setup: rigid fetoscope with neonatal orotracheal tube preloaded. **C.** Schematic illustration of tongue displaced digitally to expose the oropharyngeal inlet. **D.** Diagram of endoscopic-guided tube placement under EXIT conditions.

Figure 1. EXIT procedure showing SAFE technique in progress. **2-3.** Endoscopic visualization of glottis and laryngeal landmarks. **4.** Tube advanced gently through vocal cords under fetoscopic guidance. **5.** Correct intratracheal placement verified **6.** Secured airway achieved, ensuring perinatal stabilization.

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