

Background

- Occipitocervical fusion (OCF) is associated with potentially fatal airways events and postoperative feeding difficulties.
- Studies suggest that the fusion occiput–C2 (O–C2) angle (Figure 1) may be associated with feeding and airway difficulties due to narrowing of pharyngeal outlet.
- Pharyngeal obstruction may make reintubation anatomically impossible and necessitate emergent front-of-neck airway access
- Lumbar plexus block “LPB” provides good anesthetic coverage, but controversies remain about its safety

Methods

- Retrospective study of 22 adult (>18 years) patients who underwent OCF at Westchester Medical Center, NY between October 2020 and December 2024.
- Subjects identified by Current Procedural Terminology code 22590
- Primary predictor change in OC2 angle from before and after fusion, stratified by quartiles
- Covariates included Age, sex, body mass index (BMI), operative duration, and transfusions
- Outcomes:
 - Need for Reintubation
 - Need for Tracheostomy
 - Need for Gastrostomy
- IRB Exempt (New York Medical College, #24078, 1/29/2025)

Figures

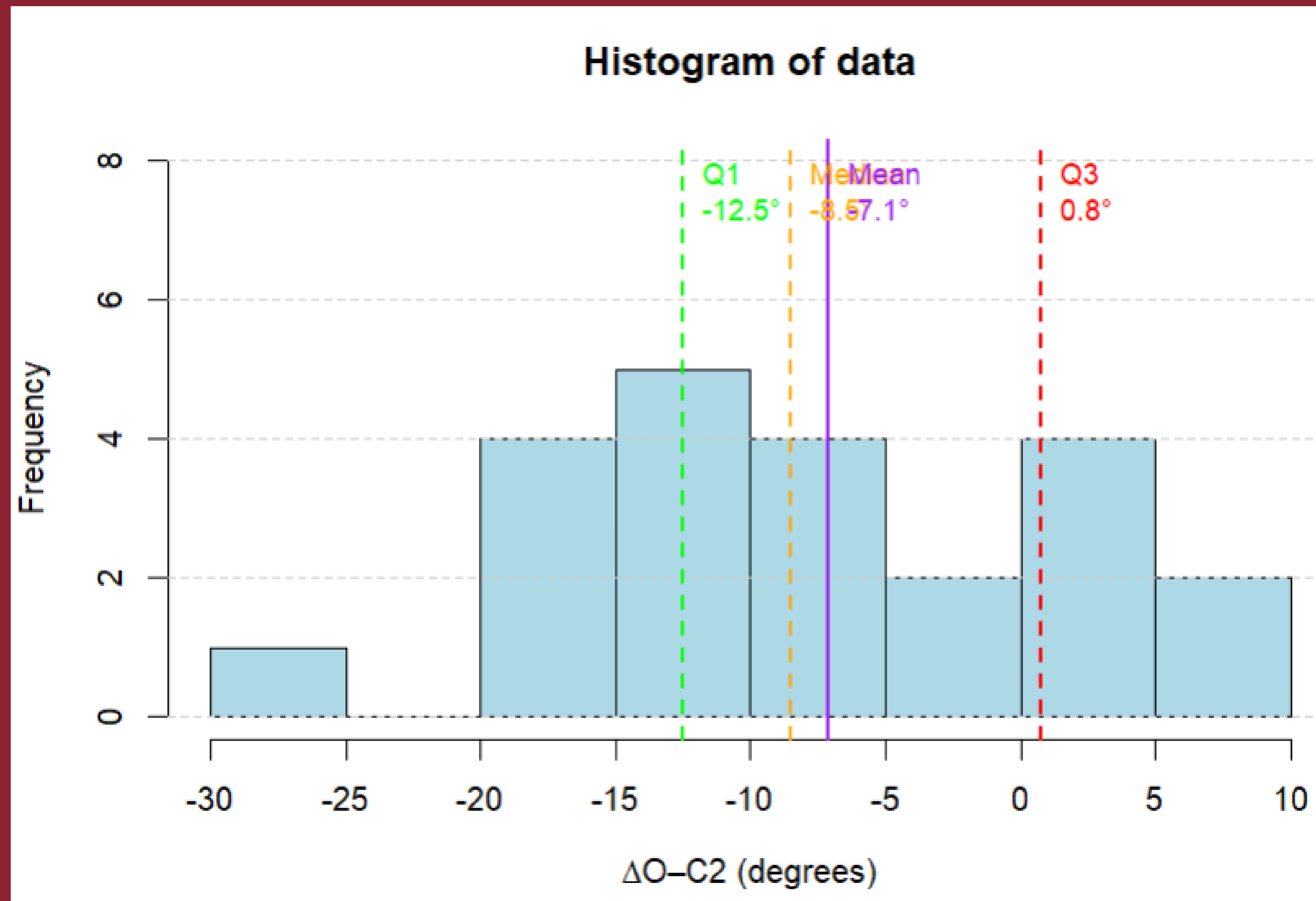
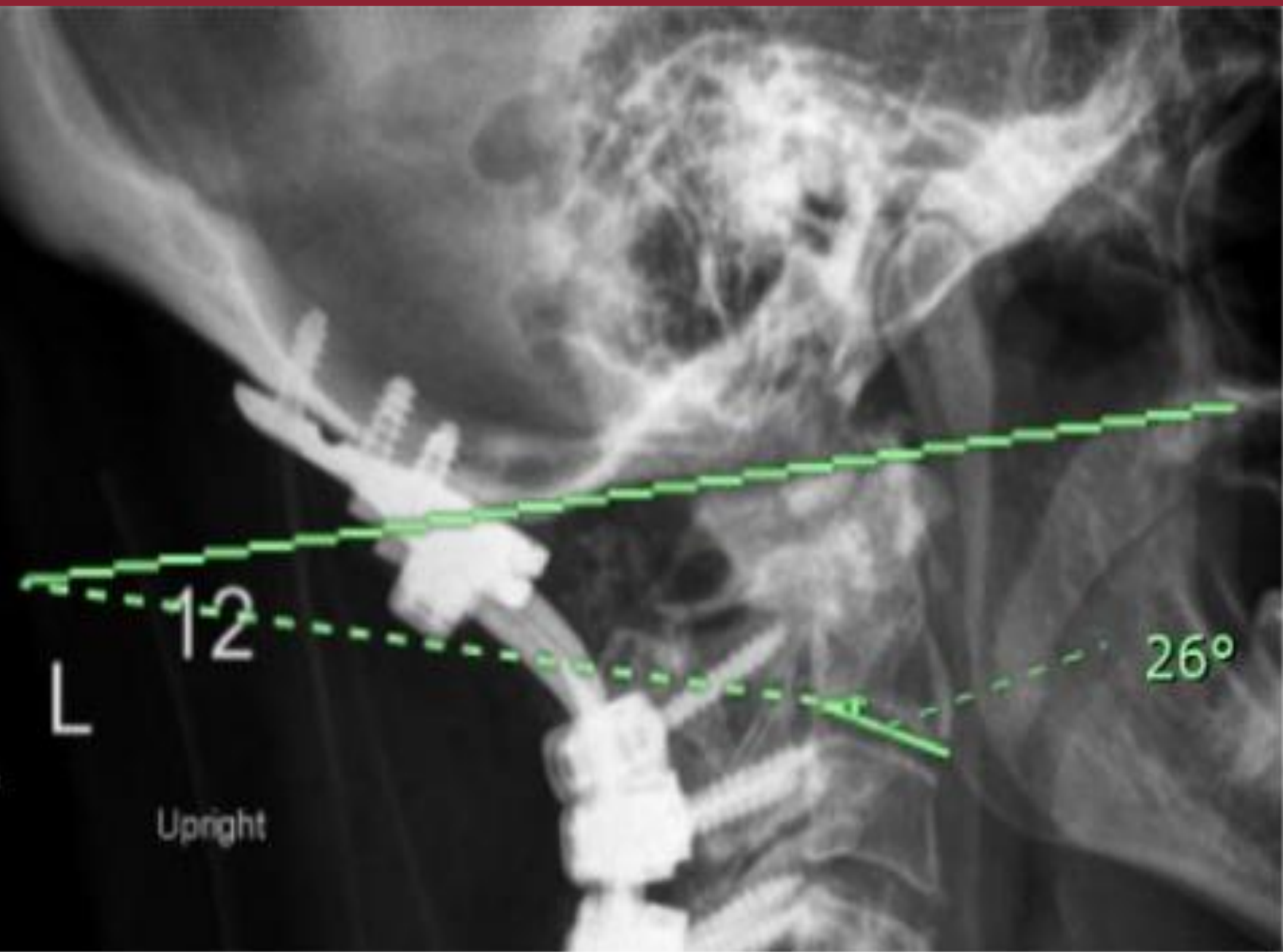


Figure 1: OC2 Angle measurement between C2 Endplate and McGregor line (top left)

Figure 2: Histogram of Data (top right)

Table 1: Outcomes following OCF (Bottom)

Total (N=22)			
	ΔO–C2a < 12 ° (n=16)	ΔO–C2a > 12 ° (n=6)	p value (Fishers)
Proportion of patients needing reintubation	6% (1)	50% (3)	0.046
Proportion of patients with dysphagia	25% (4)	100% (6)	0.0028
Proportion of patients with severe dysphagia	0	67% (4)	0.0021
Proportion of patients needing surgical airway	6% (1)	50% (3)	0.046

Discussion

- A ΔOC2 of 12° is associated with a significantly higher rate of reintubation, dysphagia, and tracheostomies compared to <12.
- This angle can be assessed prior to final fixation by spine surgeons, and may provide a modifiable target to avoid postoperative airway complications.
- Dysphagia and airway compromise may lie on a spectrum
- More data is needed, but it is possible certain patients with a high ΔOC2 may benefit from elective tracheostomy in the OR rather than extubation. This is in line with ASA Difficult Airway Guidelines

References

1. Izeki M, Neo M, Takemoto M, et al. The O–C2 angle established at occipito-cervical fusion dictates the patient's destiny in terms of postoperative dyspnea and/or dysphagia. Eur Spine J 2014;23(2):328–36. doi: 10.1007/s00586-013-2963-6 [published Online First: 20130825]
2. Khan MF, Bow-Keola J, Gensler R, et al. Occipitocervical fusion and serious airway adverse events: A systematic review. J Clin Neurosci 2025;136:111239. doi: 10.1016/j.jocn.2025.111239 [published Online First: 20250410]
3. Huang F, Zhong Q, Wang Y, et al. Failed reintubation during resuscitation after posterior occipito-cervical spinal fusion: A case report. Medicine (Baltimore) 2023;102(40):e35427. doi: 10.1097/MD.00000000000035427