



Vascular Injury during Central Venous Access Insertion under General Anesthesia

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Introduction

Central venous catheter placement in children under general anesthesia carries a low rate of serious complications^{1,2}.

However, complications during placement can require extensive intervention

• Rare but potentially serious complications:

- Arterial cannulation
- Hemothorax due to arterial or venous injury
- Pneumothorax
- Air embolism

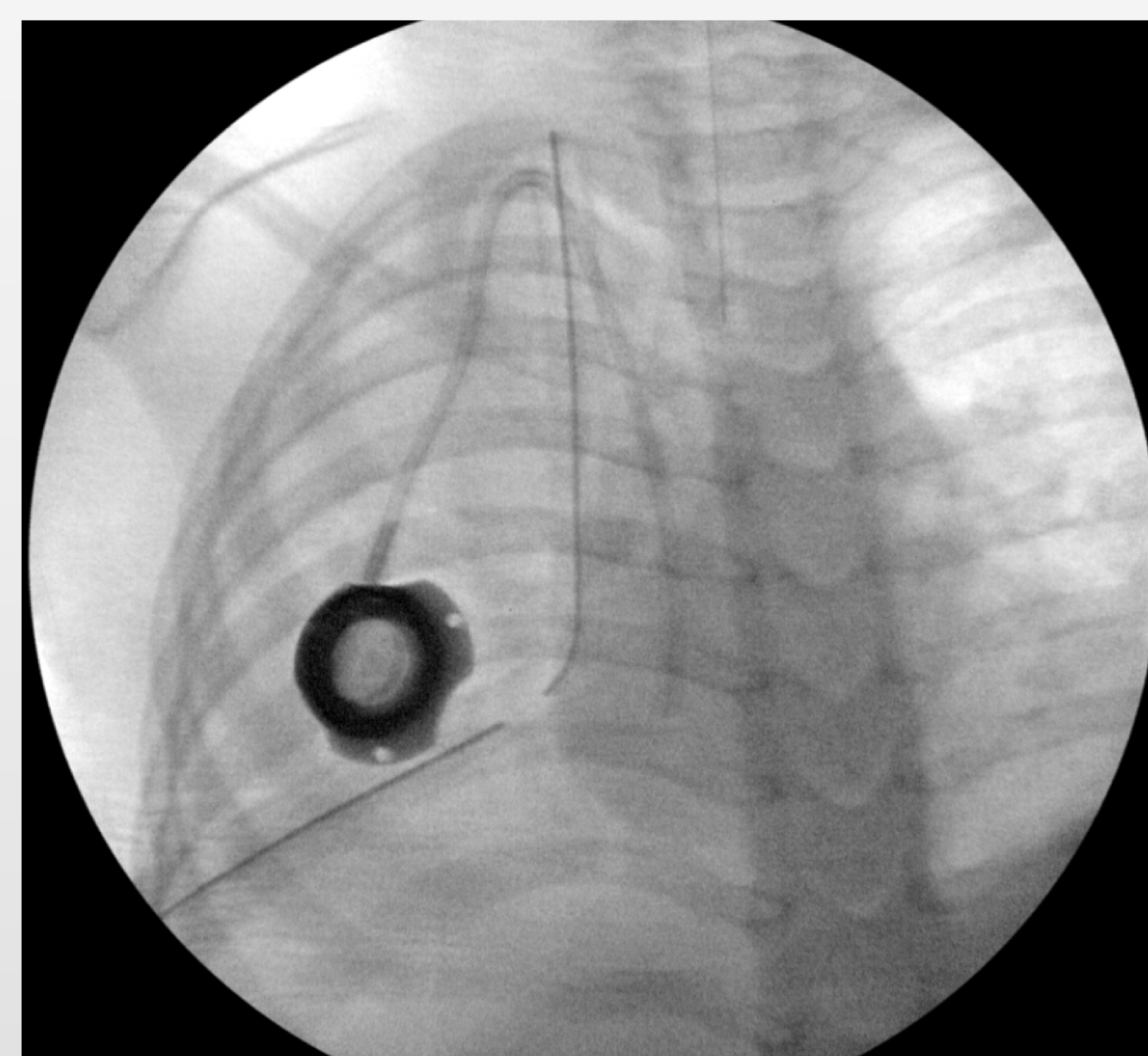


Fig. 1: X-Ray after second port placed without significant mediastinal shift

Case (Port Placement)

2 year old otherwise healthy female with new renal mass undergoing port placement for chemotherapy

- General anesthetic
 - Mask induction with sevoflurane
 - 22 g IV placed in L hand
 - Maintained on end-tidal sevoflurane of 3%
 - Unreactive to incision
- Coughs and desaturates with dilator and sheath insertion
 - Episode resolved with bag/mask and Propofol bolus
 - Fluoroscopy shows wire within superior vena cava (SVC)
- Port placed, but unable to draw back through line
 - Fluoroscopy shows catheter at lateral edge of SVC, wire outside
 - Catheter and wire removed
- Opacification of right hemithorax
 - Patient hypotensive, VBG sent
 - Chest tube placed, 300 mL bloody output
 - Volume responsive, received 1L LR, 250 mL albumin, 1u PRBC
- New port placed in RIJ
- Hemodynamically stable at the end of the case
 - Transthoracic echo shows no evidence of pericardial effusion
- Extubation
 - Shortly followed by hypotension, massive chest tube output

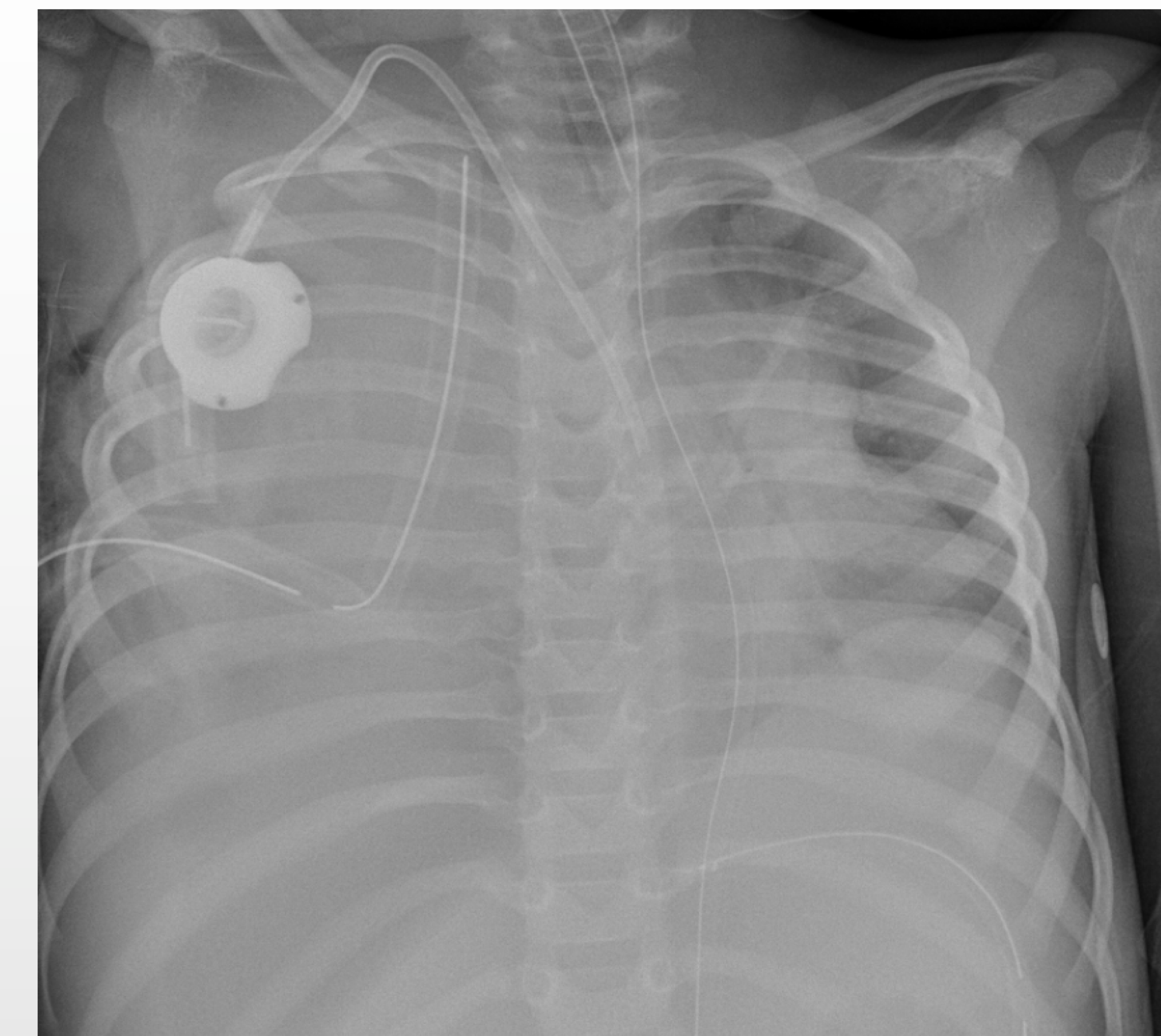
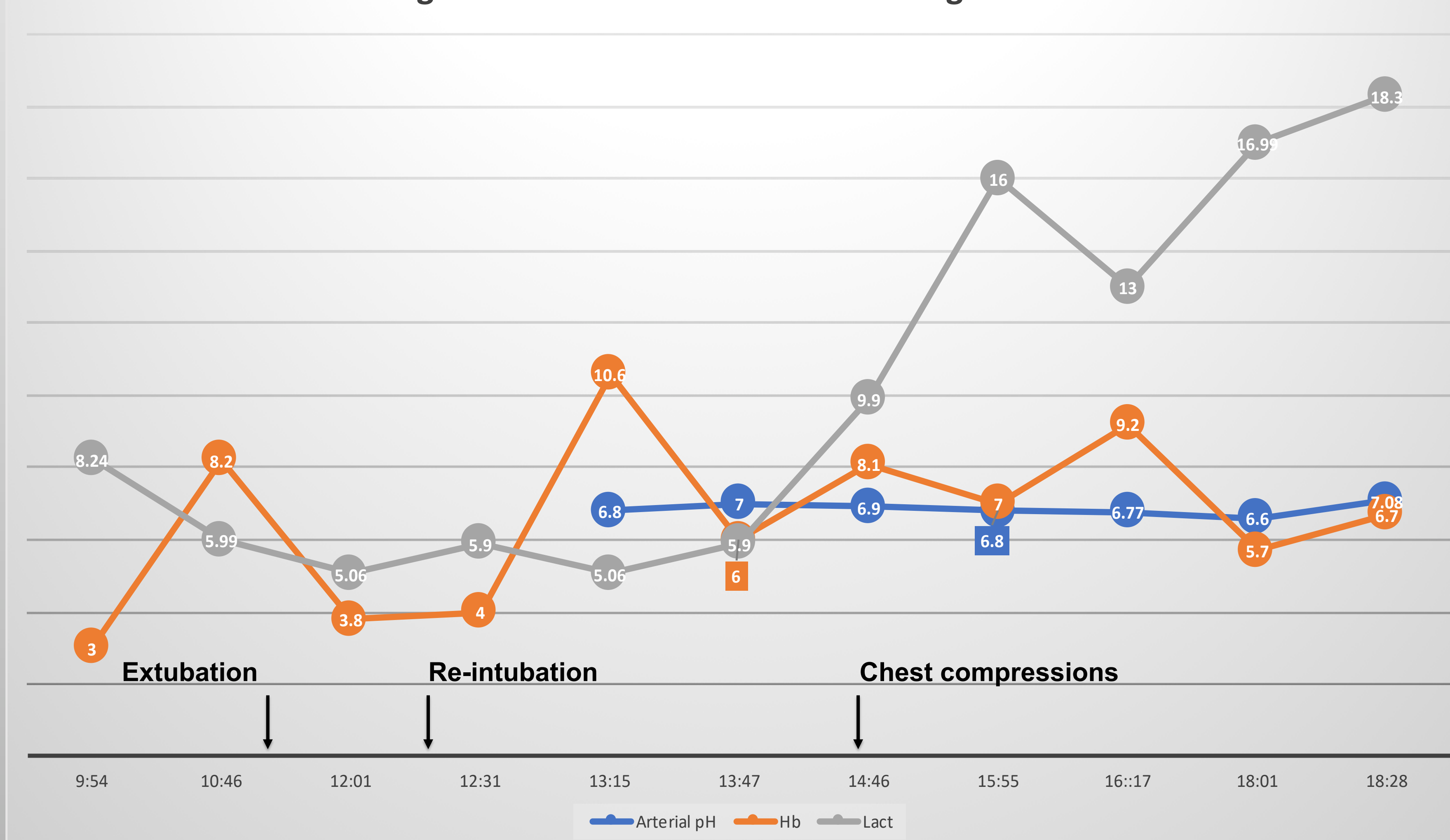


Fig. 3: X-Ray shortly after patient re-intubated. Right hemothorax causing a mediastinal shift to the left and enlargement of the rib spaces on the right.

Progression of Critical Lab Values throughout Case



Case (Thoracotomy)

- Re-intubation for thoracotomy
- Lower extremity access via IO
- Hemodynamic instability throughout second stage of case
 - massive transfusion, inotropes, and CPR
 - Total fluid resuscitation of over 5 estimated blood volumes
- Unable to maintain adequate ventilation
 - Cannulated for VV ECMO
- Severe anoxic encephalopathy
 - Care withdrawn in PICU on POD 6

Fig. 2: Venous gasses were drawn starting from soon after discovery of the hemothorax. Arterial gasses were sent once access permitted.

Conclusion

- Injury to major vessels is rare, but associated with high mortality²
- Operating room setting ideal, but not necessarily protective of poor outcomes
- Future considerations
 - Remain intubated
 - Early establishment of lower extremity access
 - Establish plan for removal

References

1. Malbezin S, Gauss T, Smith I, et al. A review of 5434 percutaneous pediatric central venous catheters inserted by anesthesiologists. *Pediatric Anesthesia*. 2013;23(11):974-979.
2. Askegard-Giesmann JR, Caniano DA, Kenney BD. Rare but serious complications of central line insertion. *Seminars in Pediatric Surgery*. 2009;18(2):73-83.