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Safe Placement of Central Venous Catheter Tip in the Operating Room

A prospective clinical audit using the carina as a radiological landmark

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BACKGROUND

Central venous catheterisation is routine in the operating room,

Tips lying below the pericardial reflection carry a small but potentially fatal risk of cardiac tamponade, as well as arrhythmia, coronary sinus cannulation and tricuspid valve injury.[1] Higher tips may erode the vessel wall, causing hydrothorax or hydromediastinum, but are less often fatal.[2]
As the carina consistently lies above the pericardial sac in cadaveric studies, it is a reliable radiological target.[1,3]

METHODOLOGY

- Prospective audit of 50 patients, approved by the QPSD, SKMCH&RC.
- Chest radiograph in the PACU after each insertion.
- Tip classified as at, above or below the carina; distance from the carina measured if malpositioned.
- Catheter length at skin and any repositioning recorded on a structured proforma; data analysed in Microsoft Excel.

RECOMMENDATIONS

- Identify the carina on every post-insertion radiograph and reposition tips lying below it.
- Teaching sessions on the risks of tip malposition and on insertion depth.
- Periodic re-audit to monitor compliance and close the audit loop.

RESULTS

Objective: to audit tip position against the carina for catheters placed in the operating room.

n = 50 · Adults 45 (90%), paediatric 5 (10%) · male 58%, female 42% · right IJV 49, left IJV 1

Figure 1. Catheter tip position relative to the carina (n = 50)

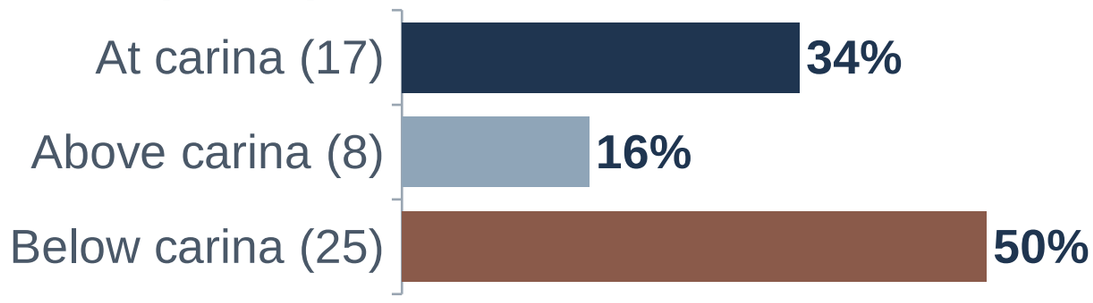
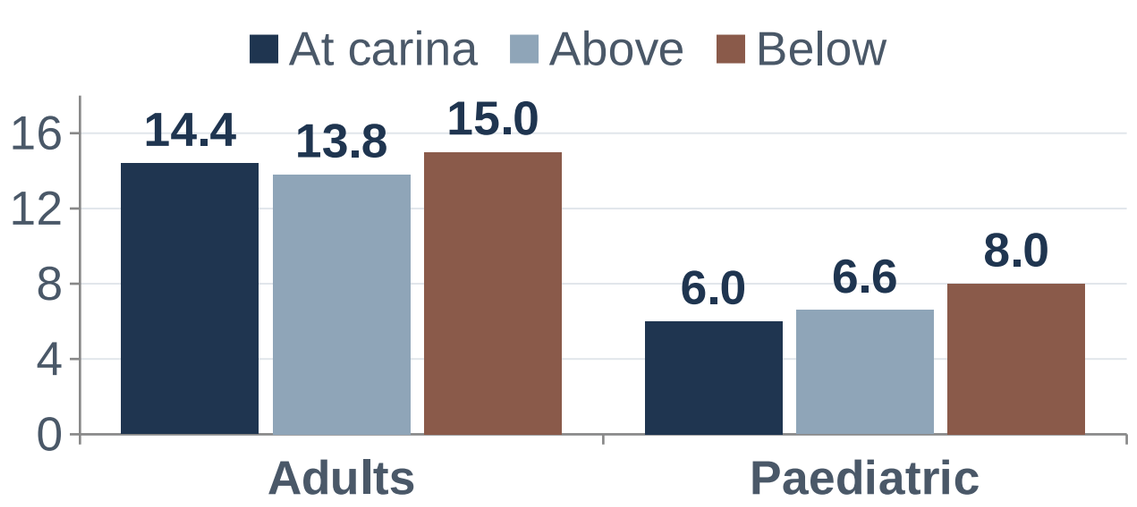


Figure 2. Mean catheter length at skin (cm) by tip position



Tip position was adjusted in only 2 cases (4%).

CONCLUSION

- Only one-third of catheter tips lay at the carina; half were below it, within the zone of potential intrapericardial placement.
- Malposition was rarely corrected once identified.
- In adults, a skin mark of about 14 cm most often placed the tip at the carina.

REFERENCES

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