Placement of Air Aspiration Catheter

Anesthesia Guidelines
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Overview

The following is a step by step description of CVP catheter placement in the right atrium for the purpose of air aspiration using the catheter tip as an EKG exploring electrode:

Materials

EKG machine with front-end isolation, battery power and V lead capabilities; Johans adapter or equivalent; V lead wire with attachment for Johans adapter or equivalent; 10cc syringe with 8.4% NaHCO3; Cook or Arrow multi-orifice CVP catheter.

The Procedure

1) Remove all wire grounding plates and other electrical connections (except EKG leads) from patient.

2) Place 16 gauge short catheter into right arm antecubital vein. First choice is basilic vein. Second choice is cephalic vein. If cannot place catheter in right arm, left arm basilic vein may be used providing CVP catheter is long enough to reach right atrium. If arm vein cannulation successful, advance catheter introducer wire to silver mark. If arm vein cannulation fails, go to right internal jugular vein. If using right basilic vein, abduct patient’s right arm to 90 degrees.

3) Advance catheter over wire until ectopy is seen on EKG. Catheter tip is probably in RV when ectopy occurs.

4) Remove wire.

5) Attach syringe with 8.4% NaHCO3 and stopcock to catheter, aspirate to remove bubbles then flush.

6) Turn lead switch on EKG machine to V lead. Attach V lead to Johans adapter or equivalent. Do not attach catheter to transducer or other extension catheter as this alters impedance, resulting in poor trace.

7) When catheter tip is in RV should see QRS with amplitude larger than P amplitude. If trace is poor, flush catheter again.
8) Withdraw catheter until P wave becomes larger and still further till P wave is biphasic and larger than QRS. At this point, the middle of the multi-orificed portion of the catheter is positioned at mid right atrium. Withdrawing catheter 4 cm places middle of orifices at SVC-RA junction. Should see maximum negative amplitude P wave. Withdrawing catheter an additional 1 cm should place distal tip at best site for air aspiration. Usually, P wave will remain negative but magnitude of negative deflection will not be as great as when the middle of the multi-orificed portion of the catheter is at SVC-RA junction. A small biphasic P or positive P wave may be seen when the catheter tip is several cm above the IVC.

9) Lightly tape catheter and check P wave after patient situated in sitting position.

Notes

On bringing arm to patient’s side and on going from supine to sitting position, the catheter tip frequently descends further towards heart.

Recheck tip position, after patient placed in final operative position.

In the sitting position with the neck flexed, it is frequently easier to withdraw the catheter placed in the internal jugular vein but impossible to insert it further.

If catheter is to remain post-op, withdraw it to mid or high SVC to avoid risk of cardiac puncture. In PACU obtain chest x-ray to confirm position.

References


