Subclavian Vein Central Line Placement

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Preference Card

- Three lumen central kit
- Lidocaine 1% with or without epinephrine

Patient Positioning

- The patient is placed supine with arms toward the side and head turned away from the implanting clinician.
- Roll between shoulders can aid with exposure.
- ChloraPrep is used as skin preparation.
- Maximum sterile barrier is used.
- The patient is placed in Trendelenburg position.
- The sternal notch and acromion are palpated.
- The site for needle insertion is chosen midway between the sternal notch and acromion below the curve of the clavicle (Fig. 27.1).
- Equipment is checked and central line is flushed.

Nodal Points

Prep, Drape, and Checking Kit

- The neck and upper chest should be prepped with ChloraPrep solution over the area until a suitably sized sterile field is obtained (about 5–6″ in diameter).
- The catheter kit is opened sterilely.
- Sterile gowns and gloves should be used by those in the room.
- A sterile surgical drape should be placed over the upper chest centered on the clavicle.

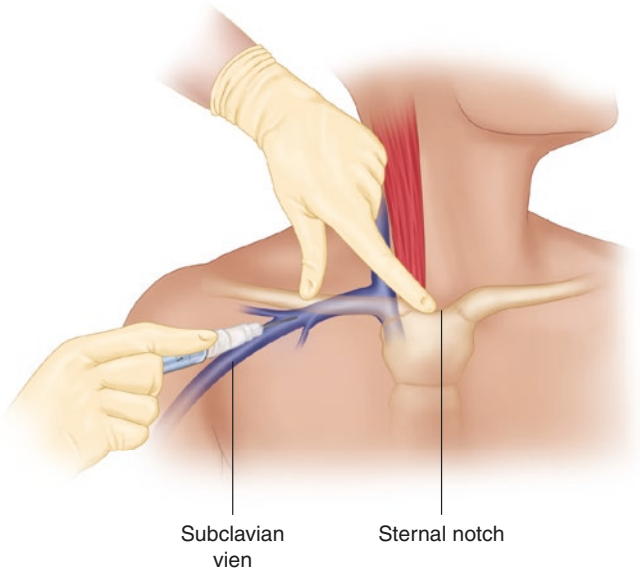

Fig. 27.1 The 18-gauge needle is then inserted and advanced horizontally toward the clavicle, again directing it 1 fingerbreadth above the clavicle

- The central venous catheter should be checked to ensure that the ports are open and not capped. All ports should be flushed.

Preparing the Insertion Site

- Using a 22-gauge needle, 1% lidocaine is injected at the needle entrance site.
- The needle is then advanced toward the clavicle and directed a fingerbreadth above the sternal notch, keeping the needle and the barrel of the syringe in the horizontal plane.
- As the needle touches the clavicle, additional local anesthesia is injected.

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Canalization of the Subclavian Vein

- The 18-gauge needle is then inserted and advanced horizontally toward the clavicle, again directing it 1 fingerbreadth above the clavicle (Fig. 27.1).
- The needle is then marched down under the clavicle and again advanced along toward a point 1 fingerbreadth above the sternal notch.
- The entrance of the needle into the subclavian vein is confirmed by blood return (Fig. 27.2).

Canalizing Vein with Guide Wire and Dilatation of Vein

- The J-wire is threaded through the needle (Fig. 27.3).
- Remove the needle over the J-wire, having control of the wire at all times.
- Watch monitor as guide wire is advanced. Ventricular ectopy indicates placement in RV, and guide wire should be pulled back a few cm.
- Skin is stabbed using an 11-blade, which will allow the catheter to pass freely.
- A vein dilator is passed over the J-wire (Fig. 27.4).

Thread of Central Line Through Wire and Fixation of Line

- The catheter is then threaded over the J-wire; assure wire control (Fig. 27.5).
- Once catheter in place, the J-wire is removed.
- The catheter is flushed with saline.
- Immediately following placement, each of the ports is aspirated and flushed to verify patency. If any resistance is encountered, then obstruction of the catheter in the

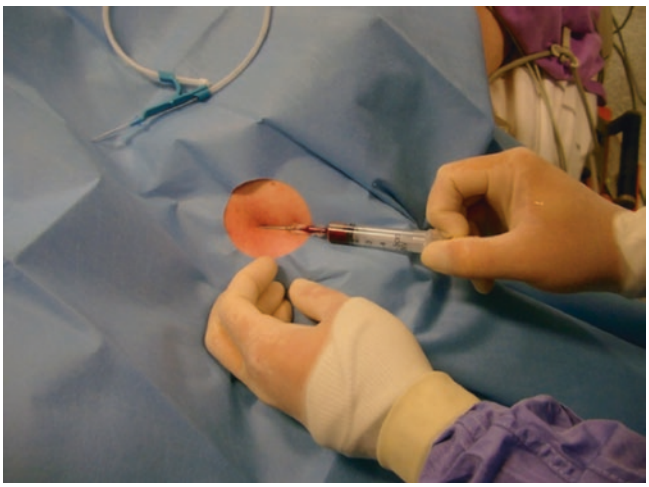

Fig. 27.2 The entrance of the needle into the subclavian vein is confirmed by blood return

Fig. 27.3 J-wire is advanced through the needle

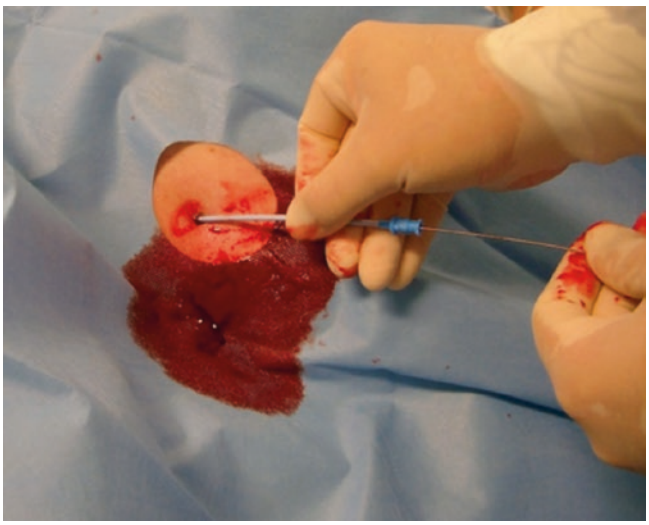

Fig. 27.4 A vein dilator is passed over the J-wire always having control of the wire

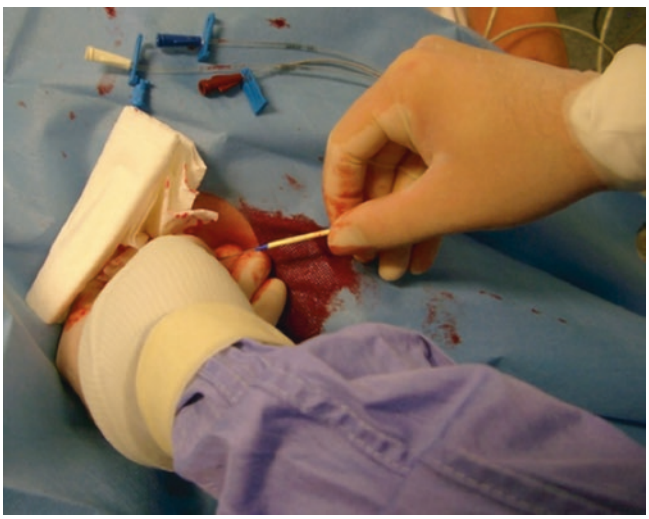

Fig. 27.5 The catheter is then threaded over the J-wire

Fig. 27.6 Central line is stitched in placed; antibiotic disc and occlusive dressing are placed

vein insertion site, the tunnel, or at the junction of the catheter with the reservoir should be suspected. These sites should be inspected.

Confirmation of Line Position and Assessment of Pneumothorax

- Obtain a chest x-ray.
- The catheter is secured with 3-0 silk sutures.
- Apply an antibiotic disk over the skin where catheter enters.
- Use an occlusive dressing over this (Fig. 27.6).
- The position of the catheter with its tip in the right atrium should be verified.

Pitfalls and Pearls

- Ultrasound guidance improves initial cannulation success.
- Subclavian artery puncture is not uncommon. Management involves withdrawal of the needle and applying pressure over the site for 5–10 minutes. Elevation the arm will also help vein compression. Ipsilateral access can be later re-attempted.
- Dilatation and cannulation of the subclavian artery, however, may be associated with more complications such as bleeding, thrombosis, or creation of pseudoaneuryms. In that case, the catheter should not be manipulated and the vascular surgeons be involved.
- If anatomy is amenable bilaterally, left subclavian access is preferable as it has lower rates of malposition and vessel trauma.
- Subclavian artery puncture during vein localization is not uncommon and can be managed by withdrawing the needle and applying pressure over the site for 5–10 minutes. Elevation of the ipsilateral arm overhead may help to compress the vein. If arterial catheterization is confirmed, the catheter should be left in place and a vascular consult obtained.

Access Reader Checklist Appendix

☑ READER CHECKLIST
Subclavian Vein Central Line Placement

☑ PREFERENCE CARD

►**Instruments**
__3-lumen central kit
__Lidocaine 1% with or without epinephrine

☑ PATIENT POSITIONING/ OPERATING ROOM SETUP

►**Patient Positioning**
__Patient placed supine with arms toward side and head turned away from implanting clinician
__Roll between shoulders can aid with exposure
__ChloraPrep used as skin preparation.
__Maximum sterile barrier used
__Patient placed in Trendelenburg position
__Ssternal notch and acromion palpated.
__Site for needle insertion chosen midway between sternal notch and acromion below curve of clavicle
__Equipment checked and central line flushed

☑ NODAL POINTS

►**Prep, Drape and Checking Kit**
__Neck and upper chest prepped with ChloraPrep solution over area until suitably sized sterile field obtained (about 5-6" diameter)
__Catheter kit opened sterilely.
__Sterile gowns and gloves should be used by operating room personnel
__Sterile surgical drape should be placed over upper chest centered on clavicle.
__Central venous catheter should be checked to ensure that ports are open and not capped.
__All ports should be flushed

►**Preparing Insertion Site**
__Using 22-gauge needle, 1% lidocaine injected at needle entrance site
__Needle advanced toward clavicle and directed a finger-breadth above sternal notch, keeping needle and barrel of syringe in horizontal plane
__As needle touches clavicle, additional local anesthesia injected

►**Cannulization of Subclavian Vein**
__18-gauge needle inserted and advanced horizontally toward clavicle, again directing it one finger-breadth above clavicle
__Needle marched down under clavicle and again advanced along toward a point one finger-breadth above sternal notch
__Entrance of needle into subclavian vein confirmed by blood return

►**Canalizing Vein with Guidewire and Dilatation Vein**
__J-wire threaded through needle
__Remove needle over J-wire, having control of wire at all times
__Watch monitor as guide wire advanced
__Ventricular ectopy indicates placement in RV, guidewire should be pulled back a few centimeters
__Skin stabbed using 11-blade, which will allow catheter to pass freely
__Vein dilator passed over J-wire

►**Thread of Central Line Through Wire and Fixation of Line**
__Catheter threaded over J-wire
__Aassure wire control
__Once catheter place, J-wire removed
__Catheter flushed with saline
__Immediately following placement, each ports aspirated and flushed to verify patency.
__If any resistance encountered, possible obstruction of catheter in vein insertion site, tunnel, or junction of catheter with reservoir; these sites should be inspected

►**Confirmation of Line Position and Rule Out Pneumothorax with Chest Xray**
__Obtain chest x-ray
__Catheter secured with 3–0 silk sutures
__Apply antibiotic disk over skin where catheter enters
__Use occlusive dressing over this
__Verify position of catheter with its tip in right atrium