**Translumbar and Transhepatic Placement of Hemodialysis Catheters**

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Not a primary means of central venous access.

Only in patients without other medical options.

**Translumbar Catheter Placement**


**Translumbar Puncture into IVC**

Put patient prone (right is right)  
US or CT guidance...  
Puncture 10 cm above iliac crest and 10 cm right of midline.  
Aim for L2-L3

21G 15cm needle advanced 45 degrees cephalad and medial towards IVC under fluoroscopy.

May touch vert body and redirect anterior. If unsuccessful, put in wire to mark IVC.

Aspirate to confirm entry into IVC

Inject contrast to confirm needle placement then place .018 wire.
Translumbar Puncture into IVC

A coaxial dilator with an inner metal stiffener is used to access IVC, stiff wire then placed into IVC

Tunnel laterally
Long tunneled to exit side
Choose a long catheter

Pull catheter through tunnel
Catheter into peel away sheath
Remove sheath

Translumbar Puncture into IVC

Cannot get hemostasis at puncture site
60-80cc blood loss typical around IVC

Risks - infection, fibrin sheath, IVC thrombosis, dislodgement (13%)

Can place catheter above/through IVC filter (target)
Can perform catheter exchange over wire

Translumbar central venous catheters for long-term haemodialysis.

Retrospective study
26 patients
39 translumbar catheters
1 retroperitoneal hematoma
1 year cumulative assisted primary patency rate 73%
2.84/1000 catheter days infection rate (2.02/1000 catheter days exit site infection**)

Translumbar High Inferior Vena Cava Access Placement in Patients with Thrombosed Inferior Vena Cava Filters

Oblique view of needle and 0.018-inch guide wire being advanced into IVC with patient in prone position. Right renal artery passes posterior to IVC at this level...do not puncture it!!

Ash Split hemodialysis catheter (14 F, 40 cm) positioned within the atrium.
Azygos Vein Dialysis Catheter Placement Using the Translumbar Approach in a Patient with Inferior Vena Cava Occlusion

Prone venography shows right ascending lumbar (A), prominent azygos (B), accessory hemiazygos (C), and hemiazygos (D) veins.

Translumbar placement of the catheter into the right ascending lumbar vein.

Tip in upper portion of azygos vein.


Occluded jugular, subclavian, femoral, renal and IVC. Transhepatic vein access with target/snare into IVC at left renal vein.

Transhepatic Guidance of Translumbar Hemodialysis Catheter Placement


Transhepatic Catheter Placement

Much less common for hemodialysis catheter placement than translumbar placement.

More commonly described in the pediatric literature.

Transhepatic Catheter Placement: Approach

Similar to biliary work, except the goal is to opacify a hepatic vein instead of the biliary tree

U/S guidance…or

Mid-axillary approach through the level of ribs 10-12

15-cm long 22-gauge Chiba needle (Cook, Inc) advanced above the rib into the liver parenchyma

Dilute contrast injected under fluoroscopy as needle withdrawn

Opacify hepatic vein

0.018-inch wire advanced into IVC

Place dilator with inner metal stiffener (Accustick, Boston Scientific)
Transhepatic Catheter Placement: Approach

- Exchange for standard 0.035-inch stiff guidewire
- Dilate tract and place peel-away sheath
- Create tunnel superiorly (?)
- Longer catheter required
- Place tip in RA

Transhepatic Catheter Placement

Risks - hepatic vein and IVC thrombosis, dislodgement, intraperitoneal hemorrhage, cardiac tamponade secondary to right atrial erosion

Percutaneous transhepatic venous access for hemodialysis.

- Retrospective study
- 12 patients
- 36 catheters (17 new, 19 over the wire exchanges)
- Translumbar catheter placement exhausted
- Mean primary patency 27 days
- Secondary patency 70 days
- 21 replaced or removed due to catheter thrombosis
- 2.2/1000 catheter days infection rate
- 5 (14%) respiratory migration

Transhepatic catheter access for hemodialysis.

- Retrospective study
- 16 patients
- 21 catheters
- 30 exchanges in 10 patients
- 5 (24%) dislodged
- 6 (29%) complications, including one death from intraperitoneal hemorrhage

Transhepatic hemodialysis catheters: functional outcome and comparison between early and late failure.

- Retrospective study
- 22 patients
- 127 catheters (tips in 105 RA, 15 IVC, 4 SVC, 1 hemiazygous, 1 Hepatic, 17)
- 24 transhepatic access sites
- 105 exchanges in 14 patients (high maintenance rate)
- 37% migration
- 22% sepsis
- 17% catheter thrombosis
- Cs’s: bleeding, intercostal pain, 1 death due to MI
Other Placement Sites

Brachiocephalic Vein

Hold transducer at very steep angle posterior to clavicle. Puncture without needle guide. Clamp marks needle entry site into skin. Arrow entry site into vein. Final image.


Other Placement Sites

Collateral thyrocervical and other neck veins

U/S of neck - multiple collaterals, no jugular, assume stenosis/occlusion

Can access collateral under U/S

Place snare from below and use as target

From punct
Cath in subcl branch
Snare into collateral
Grab wire with snare


Other Placement Sites

Femoral Vein

Insertion site asterisk. Tunnel arrows.

Tip to posterior IVC. Arterial lumen (arrow) faces medial, away from IVC wall.


Other Placement Sites

Transrenal access into IVC

Occl'd IVC at filter
Left transrenal wire into IVC/RA
Final CT image


External iliac vein access into IVC

48 yo F with bilateral subclavian, brachiocephalic and femoral vein occlusions. Surgical exposure (retroperitoneal approach) of external iliac vein with catheter placement.


Other Placement Sites

Direct SVC puncture
Summary

Review all radiological studies involving central veins.

Identify occluded vessels, collaterals, etc…stenoses and occlusions can be crossed.

Pick best site - least discomfort, least risk of infection, thrombosis, dislodgement.