



Complications of Hemodialysis Catheters

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Disclosures



• I have no conflict of interests to disclose.



- 1. Site selection
- 2. Fluoroscopy must be at hand
- 3. Patient position
- 4. LA & sedation
- 5. Prophylactic AB



- 6. Close adherence to sterility
- 7. Sterile drape
- 8. No touch technique
- 9. Access under real-time US guidance
 - * Jugular vein should be punctured just above the clavicle







US-guided access











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- 10. 0.035" guidewire introduction
- 11. Confirmation of wire position in SVC down to the IVC using fluoroscopy
- 12. 1-cm skin incision at the wire entry

























- 13. Exit site incision
- 14. Access site dilation
 - * Passage of all dilators and sheaths over the wire under fluoroscopic visualization
- 15. Subcutaneous tunneling









- 16. Peel-away sheath insertion
- 17. Introducer and wire removal
- 18. Catheter insertion through the peel-away sheath
- 19. Peel-away withdrawal









- 20. Aspiration of both lumens (using a 20cc piston syringe)
- 21. Forceful flush with saline (using a 20cc piston syringe)
- 22. Confirmation of catheter's tip and curve in case of flow resistance
- 23. Heparinization of lumens (1000 unit/mL)







- 24. Catheter fixation using 0 Silk suture
 - * Avoid direct fixation to the skin
- 25. Skin closure
- 26. Occlusive dressing















Technical Errors



 Attempted open access obtainment in a HD patient with exhausted access sites due to central venous stenosis!







Perioperative Care and Complications

- Catheter misplacement
- Pneumothorax
- Hemothorax
- Wire embolism
- Cardiac arrythmia
- Cardiac perforation
- Thoracic duct laceration
- Nerve injuries

























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Mal-located Catheter Tip and Too High Puncture Site

High Puncture Site













Venous misplacement







Venous misplacement









Intrapleural misplacement






Arterial misplacement





Inadvertent Carotid Artery Puncture



Catheter Tip in Descending Aorta



55-y/o male ESRD patient was referred for permcath insertion for the first time. Portable CXR was obtained as guidewire came across resistance in its course. Dx?



























Long-Term Care and Complications

- Catheter fall-off
- Skin reaction
- Air embolism
- Catheter embolism
- Catheter occlusion
- Central venous thrombosis/stenosis
- Stuck catheters
- Catheter-related infection

Catheter Fixation Errors



Catheter Fixation Errors







• Young male patient on HD for 2 years using a Rt femoral temporary catheter

Catheter Fall-off

• Failure of catheter's cuff to incorporate in subcutaneous tissue results in tunnel infection and consequent catheter falloff, which is commonly observed with Sliver-coated PalindromeTM catheters.

Skin Closure Scar

Pyoderma Gangrenosum after Chemotherapy Port Placement

Superficial Tunnel

Central Venous Stenosis

 ESRD patient on HD with a history of having <u>only one</u> Rt jugular tunneled HD catheter and Rt upper extremity AVF, who presented with severe arm swelling.
Venoplasty failed. Contralateral arm AVG placed and ipsilateral AVF were ligated to resolve symptoms.

Central Venous Stenosis

Central Venous Stenosis

Catheter-related Infections

Catheter-related Infections

Exit Site Infection

Tunnel Infection

Catheter-related Infections

Treatment of Catheter-related Infections

- S. aureus 21% to 43%
- Evidence of disseminated fungal infection
- Persistent fungemia after catheter removal

Amphotericin B or Caspofungin

Thank You

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Panel Case-Discussion

A 58/y-o male patient on HD via Lt jugular catheter presented with catheter dysfunction and CVO. Catheter replacement over the guide of primary catheter was attempted; however, distal catheter was stuck. What should we do?

Stuck Catheter

Solutions to stuck tunneled cuffed catheters in patients undergoing maintenance hemodialysis

He Yongchun, Jiang Hua, Huang Xiaohan, Chen Jianghua and Zhang Ping

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- Thoracotomy
- Endoluminal percutaneous transluminal angioplasty with blunt dissection
- Embedded and left in situ





























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A 48/y-o female patient on HD currently via Rt jugular temporary catheter presented with catheter dysfunction. Guidewire did not pass through the Rt jugular vein and venography revealed thrombosis of Rt internal jugular. Lt side venous pathway is intact. Should we opt for the Lt side catheter?