Routine Use of Ultrasound to Avert Mechanical Complications During Placement of Tunneled Dialysis Catheters for Hemodialysis

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Disclosures
• Nothing to Disclose

ESRD
• Number of dialysis patients in US
  Dec 31, 2015: 703,243 (USRDS)
• Increasing worldwide
• Fistula First
• 80-90% start with tunneled dialysis catheter

Inpatients who underwent placement of Tesio catheters between 1998 and 2017

2225 Tesio dialysis catheters placed in 1427 different patients. 93% were placed in the right internal jugular vein. 7% in the left internal jugular vein.

All catheters were placed with ultrasound guidance for the puncture with the selective use of a micropuncture set for patients with low volume status.

All patients underwent chest X-ray at the end of each procedure

Risk Factors
Hypertension 78.4 %
Diabetes 54.5%
Myocardial Infarction 50.7 %
CHF 32.9 %
CABG 19.4 %
Atrial Fibrillation 19.4 %
Cerebrovascular Accident 15.7 %
Hypercholesterolemia 13.5 %
Peripheral Vascular Disease 11.9 %

While placement of tunneled dialysis catheters for hemodialysis access is considered a routine procedure, it is associated with a small chance of mechanical complications. Literature examining these issues is not recent & our impression of the incidence of these postprocedural complications was at variance with pre-existing publications.
Results

In this consecutive series, NO case of post-procedure hemothorax or pneumothorax.

Two cut-downs had to performed due to injury to branches of the external carotid artery.

3 patients had to have a subsequent revision of the catheter due to malpositioning of the catheter.

Conclusion

Using modern day techniques, the incidence of mechanical complications for placement of Tesio catheters is quite low.

Further data is needed to confirm these data and revise the standard of care for these complications.

Discussion

• The KDOQI guidelines (2.4.2) do suggest the role of DUS during placement of TDC.

• Not incorporated in surgical or critical care literature.

Not always straightforward

• 35 venograms were performed due to difficulty encountered with placement of the guidewire. Patent veins were all crossed with the use of angle-guiding catheters, angled glidewires, and a torque vise.

• If chronically occluded intrathoracic veins were identified, an alternate site was selected for the placement of the Tesio™ catheter.

Venographic Findings

Patent but tortuous vein in 9 severe stenosis of the intrathoracic veins in 20 chronically occluded intrathoracic veins in 6

Venoplasty of thoracic veins

In 19 cases with severe stenosis of the intrathoracic veins, balloon angioplasty with an 8-mm balloon was successfully performed, which allowed successful placement of a functional Tesio™ catheter.

In the additional one case, the catheter was not able to be placed despite angioplasty.
### Location of lesions

7 lesions that underwent balloon angioplasty were in the innominate vein
11 were in the proximal internal jugular vein
2 were in the superior vena cava

### Follow Up (12 months)

No subsequent

- Severe arm, neck or facial swelling
- No DVT noted on duplexes

### Conclusions

- Venous balloon angioplasty can be used to maintain options for the site of access for tunneled cuffed catheters and may be necessary to assist with placement of long term cuffed dialysis catheters

### Thank you