Dedicated Venous Stent Is Needed

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Disclosure

• Stock in Veniti, Inc.
• US Patent: IVUS Dx of CVD
• Stent usage in iliac-femoral veins is currently off label.

The Wallstent in iliac vein stenosis

• Excellent patency & clinical outcome; yet room for improvement:
• Can get compressed at arterial crossover points and postthrombotic stenoses. This may be a factor in reinterventions that are required in ≈20-25%.
• Significant technical difficulties with bilateral stenting: stent compression in double barrel technique in IVC, difficulty in fenestration, fenestral stenosis etc.
• IVC stent extension rarely leads to acute contralateral iliac jailing, yet chronic sub acute jailing remains a concern if the stent is endothelialized. May result in increased contralateral stenting, DVT etc.

Coning of the Stent with Thrombosis

‘Fishmouthing’ of Nitinol stent “precisely” placed at the IVC junction. Corrected with Z stent.
Routine IVC stent extension is therefore recommended.

There is no acute jailing as there is opposite iliac flow through and around IVC extension. But if the extension gets covered by tissue over time, there may be partial jailing?

18 mm Wallstent compressed to 10 mm by PTS lesion underneath the artery.

All bilateral techniques have problems: obstruction at the junction of end to side apposition technique.

Compression of one of the barrels of ‘double barrel’. More common in delayed sequential. Inter-fenestrum to correct.

FENESTRATION PREFERRED TECHNIQUE IN DELAYED BILATERAL STENTING.
TIPS needle fenestration needed if Glidewire does not pass; fenestration may be difficult or occasionally impossible.

Fenestral stenosis corrected with Z stent. Contralateral fenestration may be required to correct opposite jailing by stent within stent.

Z/Wallstent Combo Stack 20 mm Z within 18 mm Wallstent. (2 embolizations with 15 mm Z stent to upper cava; none with 20 mm Z stent)

‘Blooming’ a Z stent

Bilateral Z/Wallstent Combo Stack; Inter-digitation prevents over distension of the IVC

Cumulative Patency
Z/Wallstent Combination Stack
Results

Test Group
- Complications
  - 22 reinterventions (77% involving only Wallstent tail, 23% involving entire combo stack)
  - 4 stent thromboses (3 involving only Wallstent tail, 1 involving entire combo stack)
  - 7 DVTs not involving stents (6 ipsilateral, 1 contralateral)

Control Group
- Complications
  - 59 Reinterventions (49 ipsilateral only, 5 bilateral, 5 contralateral only)
  - 9 stent thromboses
  - 7 DVTs (5 contralateral, 2 ipsilateral)

Comparison of Test and Control Groups (Mann-Whitney Test)
- DVT/Stent thromboses: p = 0.04
- Reintervention: p < 0.0001

Conclusion
- Z stent modification of Wallstent stack has significant technical advantages in bilateral stenting.
- It may reduce the need for later contralateral stenting arising from possible sub acute jailing
- It is less susceptible to compression by primary and postthrombotic lesions and may reduce reinterventional rate by maintaining unobstructed flow.
- However it is a home made device. A dedicated venous stent embodying these advantages is needed.

Stent compression by MTS

END
Clinical Outcome

- **Pain**
  - Partial relief in 163/196 (83%)
  - Complete relief in 101/196 (52%)
- **Swelling**
  - Partial relief in 114/193 (59%)
  - Complete relief in 34/193 (18%)
Case Material

Test Group
• Z/Wallstent Combination Stack
• 227 limbs
• Cumulative follow-up: 24 months (2011-2012)

Control Group
• Exclusive Wallstent Stack
• 218 limbs
• Cumulative follow-up: 24 months (2009-2010)

Comparison of Test and Control Groups (Mann-Whitney Test), p = ns
- Sex: p = 0.8
- Op side: p = 0.2
- Diagnosis: p = 0.4
- Age: p = 0.7

Z/Wallstent Combination Stack
• 227 limbs
  – Unilateral stenting: 133 limbs
  – Simultaneous bilateral stenting: 52 limbs
  – Staged sequential bilateral stenting: 20 limbs
  – Fenestration in a pre-existing contralateral stent: 19 limbs
  – Internal reinforcement to pre-existing Nitinol or other stent to correct external compression: 2 limbs
  – “Bridge” over large iliac vein collaterals to avoid their jailing: 1 limb

Ilio-caval Y Stent

Z Fenestration is less susceptible to fenestral stenosis and contra flow jailing than with wallstent fenestration