Selective SMA Stenting with F/BEVAR: When Indicated, Value, Best Bridging Stent, Technical Tips

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Introduction

• FEVAR has become an increasingly common treatment of juxtarenal aneurysms since Spring 2012 (commercial availability)

• Controversy remains regarding selective stenting versus universal stenting of the single-wide (10mm) scallops in the Cook Zenith Fenestrated Device

ZFEN Scallop

• 10 mm wide
• Depth from 6-12 mm
• Most common zFEN configuration is 2 small fens and scallop for SMA

Is there any data?

Unstented vs. Stented Single-Wide Scallops
38 patients in a prospectively collected trial
• Mean F/u: 26 months
• 94% vessel perfusion
• Visceral branch patency: 92% at 46 months
• 3 vessels occluded and they were unstented fenestrations or scallops
• No occlusion in stented vessels

Looked at 18 of first 28 zFEN pts
• 50% of patients had shuttering ranging from 12-40%
• All were asymptomatic Median F/u time of 11 months

Learning curve present in shuttering as it trended downward with experience

Looked at 47 FEVAR
• 7.7 month f/u
• Looked at scallops and large fans
• 21 unstented SMA scallops
• 12 stented SMA scallops
• 9/21 had some misalignment range(9-71%) (43%)
• 4 had complications, 3 stenoses and 1 occlusion.
• All patients had misalignment after 30 day CT scan showed no misalignment

Significantly more SMA related misalignment complications in the SMA unstented group than the stented group (44% vs 4%) p<0.5
• Conclusions-Routine SMA stenting of single wide scallops and large fenestrations may decrease complications

69 patients underwent FEVAR with 7 unstented scallops and 21 bare metal struts crossing the SMA
• Evaluated with duplex to see if any stenosis developed
• Only 1 asymptomatic stenosis developed and was treated with stenting 1 yr after placement
• Conclusions: Although velocities in SMA increased after FEVAR, still PSV<275 cm/s in all patients
Differing opinions of best way to treat scallops in FEVAR

At UNC we favor selective stenting of scallops

UNC Criteria for Selective Stenting of Scallop
• Misalignment of scallop determined by balloon testing
• Presence of scallop and single renal stent
• Presence of pre-existing visceral vessel stenosis in scalloped vessel
• Usually place 2 mm buffer below scallop and native vessel

Objective
• We evaluated our experience at UNC using selective stenting of scallops in the Cook Zenith Fenestrated device

Methods
• Evaluated all Cook Zenith Fenestrated cases at UNC
  – July 2010 - May 2012 Clinical Trial: 8 patients
  – June 2012 - August 2014 Post Approval: 53 patients
• Evaluated outcomes of all patients using a design with a single-wide (10 mm) scallop
• Primary outcomes assessed included patent, scallop-related complications, secondary interventions and aneurysm related death

Follow-up Protocol
• POD#1: renal/mesenteric duplex, 4 view xray
• 1 month: CTA
• 3 month: renal/mesenteric duplex and 4 view xray
• 6 month: CTA
• 9 month: renal/mesenteric duplex and 4 view xray
• 1 year: repeat CTA
• 18 months: CTA and renal/mesenteric duplex and 4 view xray
• 24 months: CTA and renal/mesenteric duplex and 4 view xray
• Yearly: CTA and renal/mesenteric duplex and 4 view xray
**Results**

- 61 Zenith Fenestrated cases performed over study period
- Mean follow-up: 240 days (3-1157 days)
- 40 patients had at least one single wide scallop designed (66%)
- Most common configuration 2 renal small fenestrations and 1 scallop for SMA (33/40) 82.5%

**Results**

- Technical success and target vessel patency was 100%
- There were 27/40 scallops unstented (67.5%) and 13/40 patients that received a stent (32.5%)
- Hospital related mortality 1/40 (2.5%)
- 0% aneurysm related mortality

**Complications**

- Stented patients (1/13) 7.7%
  - Dissection of SMA treated with BMS extension at time of initial procedure
- Unstented patients (2/27) 7.4%
  - Patient 1: Post操 nausea and elevated duplex velocities was found to have graft shuttering and underwent stenting with no further complications
  - Patient 2: Elevated velocities after losing 20 lbs by exercising over 1 year, asymptomatic
- No significant difference in complication rates

**Stent Choice**

- Atrium and self-expanding stent extension for FEVAR
- No data on VBX vs atrium

**Tips**

- Calculate distance to first branch
- Know SMA diameter in tx region
- Position II in orthogonal position
- Place stent 5-6 mm into the aortic lumen
- Flare with 10-12 mm balloon
- Inspect completion angiogram

**Change in anatomy with FEVAR and weight loss**
Conclusions

• Selective stenting of visceral vessels in single wide scallops is safe in FEVAR during short and midterm followup, if patients are carefully monitored
• Stenting all single wide scallops is not without risk
• Further validation needed:
  – multi-institutional trial
  – longer followup