Internal Iliac Artery Preservation Using Parallel Grafts: Successes And Mistakes
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Relevant Disclosures
• Dr Holden is a Clinical Investigator and Medical Advisory Board Member for Endologix
• No other relevant disclosures

Iliac Artery Aneurysms – Some FACTS
• Found in ~ one third of patients with AAA
• May also be isolated aneurysms
• 70% involve CIA, 20% IIA, 10% EIA
• Expand ~ 3mm/year
• Can present with rupture, thrombosis or embolization
• In Eurostar Registry, AAA patients with concomitant CIAAs were more likely to have Type 1B and Type 2 endoleaks, reinterventions and ruptures

Iliac Artery Aneurysms – Endoluminal Options
• Internal iliac artery embolization and EIA extension
• Flared limb (ectatic CIA up to ~ 24mm)
• Iliac branch device
• Parallel graft approach

Internal Iliac Artery Embolization – Not Benign!
• Buttock claudication – common and may not resolve
  • Unilateral embolization 27% (range 14-50%)
  • Bilateral embolization 32% (range 13-80%)
  • Symptoms more severe if distal embolization
  • Advantage of plugs over coils

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  • Advantage of plugs over coils
  • Erectile disfunction
    • Unilateral embolization 14% (range 11-45%)
    • Bilateral embolization 18% (range 11-50%)
  • Colonic ischemia – up to 3%
  • Spinal ischemia < 1%
Internal Iliac Artery Recommendations

• ESVS: Preserve at least one internal iliac artery (IIA); mandatory to avoid early complications
• SVS 2017 update guideline: strongly recommends use of an FDA iliac branched endograft to maintain IIA perfusion

Iliac Branch Devices

• Preserves internal iliac artery patency
• Adds procedural cost and complexity
• Most common complications are branch occlusion and endoleak (type 1B, type 3)
• Significantly reduce complications

Iliac Branch Devices - Complications

<table>
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<tr>
<th>Author (Year)</th>
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<th>Branches</th>
<th>Morbidity</th>
<th>Technical Success</th>
<th>Minor/ Major</th>
<th>Embolization</th>
<th>No intervention</th>
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Iliac Branch Devices - Limitations

• Planning and sizing may be complex
• Multiple anatomic exclusion criteria
• Only 35% of screened candidates are anatomically suitable

Outcomes of Endovascular Repair of Aortoiliac Aneurysms and Analysis of Anatomic Suitability for Internal Iliac Artery Preserving Devices in Japanese Patients

• 69 patients with aorto-iliac aneurysms investigated for IBD/IBE
• 17% met criteria for IBD, 25% met criteria for IBE
• Main exclusion criteria were IIA caliper and CIA length

Parallel Endograft Technique

• Modified Sandwich graft Technique Employing Aorto and Vascular Stent-graft to Preserve Hypogastric Hose in Cases of Complex Aortoiliac and Isolated Common Iliac Artery Aneurysms Including the Internal Iliac Artery Occlusion

• 21 patients with aorto-iliac artery aneurysms
• All patients unfit for open repair and not suitable for an iliac branch
• Brachial access for IIA parallel graft
• Procedural success 100%
• Primary patency 90.5% at 17.2 months mean follow up
Parallel Endograft Technique

- 22 patients with aorto-iliac artery aneurysms
  - Gore Excluder (3), Cook Zenith (1), Medtronic Talent (1), ELGX Powerlink (15)
  - Gore, Cook, Medtronic cases required brachial access for IIA parallel graft
  - Procedural success 96%
  - Primary patency for external and internal limbs was 95% and 88% respectively @ 6 months

Parallel Endograft Technique Using Endologix AFX

- We have used AFX and parallel grafts in cases not suitable for iliac branch devices
- Although we’ve performed bilateral iliac branch cases, we’ve also considered this technique in bilateral CIAA cases
- Some centres have used an Endologix limb for the CIA – EIA extension and another self-expanding endograft for the CIA – IIA component
- We prefer Gore Excluder limbs or Viabahn SE endoprostheses for both

Parallel Endograft Technique Using Endologix AFX

- Anatomic fixation of AFX on bifurcation allows access to contralateral IIA (including bilateral IIA access) without requiring a brachial approach
- Unconstrained ePTFE cover on the AFX may allow for a more reliable passive seal in the parallel graft scenario

Reverse Loaded Gore Excluder Limb

- Cut nose cone off delivery system
- Cut deployment string just below deployment knob
- Slide graft of delivery system and reverse orientate
Reverse Loaded Gore Excluder Limb

• Use Gore Dryseal sheath with collapsible valve
• Cut tapered tip off dilator
• Reverse load device over guidewire and push into place with dilator

Deploy the graft within the sheath by retrieving the deployment string
• Holding the device in place with the dilator, deploy the graft in the target location by withdrawing the sheath

Case Example

Case Example

Case Example – BE Stent Reinforcement in CIAs!
Case Example – Concomitant IIAA

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Case Example – Concomitant IIAA

Case Example – Concomitant IIAA

Limb extension to optimize CIA sealing zone

11/14/2018
Snared "buddy wire" in EIA to facilitate access

"BABE" Technique to facilitate delivery of 12F Dryseal Flex sheath

• Need to have contralateral sheath in the IIA when beginning to deploy the Excluder limb or Viabahn
• Otherwise the graft will concertina and prolapse
• I now use a 45cm of 65cm Dryseal Flex
• Didn’t think about it at the time!

Unable to re-advance the sheath or device so deployed in RCIA, embolized RIIA

Deployed RCIA – EIA Endograft and treated left
Case Example – Learning Curve Case!

Parallel Endograft Technique Using Endologix AFX

- 12 cases to date treated
- 6 cases bilateral so 18 sides treated
- Technical success 95% (17/18)
- No graft occlusions (BE stent re-lining may account for this)
- No endoleaks seen at 1 month and beyond

Mean follow up 13.4 months

Conclusion

- AFX with parallel endografts useful technique to preserve IIA patency
- Complimentary to other strategies such as iliac branch devices