Endovascular Approaches for TASC C/D Aorto-iliac Lesions: Endovascular First Approach?

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TASC C Aorto-iliac Disease

Type C lesions:
- Bilateral CIA occlusions
- Bilateral EIA lesions 3–10 cm long not extending into the CIA
- Unilateral CIA occlusion extending into the CIA
- Unilateral CIA occlusion that involves the entire length of the CIA
- Heavily calcified unilateral EIA occlusion with or without involvement of origins of internal iliac and/or CIA

- Surgery is preferred treatment for good-risk patient with type C lesion
- Need to consider patient's co-morbidities and operator's success rate when making treatment recommendations

TASC D Aorto-iliac Disease

Type D lesions:
- Intramural aortic dilatation
- Diffuse disease involving the aorta and both iliac arteries requiring treatment
- Diffuse disease involving the iliacs of CIA, EIA, and CIA
- Bilateral occlusions of CIA and EIA
- Bilateral occlusions of the CIA and EIA
- Iliac aneurysms in patients with AAA requiring treatment and not amenable to endograft placement or other lesions requiring open aortic or iliac surgery

- Surgery is treatment of choice for type D lesion

Disclosures

- None
Endovascular First: TASC C/D Lesions

- High technical success rate with modest morbidity
  - Newer available technologies
  - Increased experience and skill set: results should get even better

- Re-interventions can be performed percutaneously
  - Secondary patency rates comparable to open surgery

- Still candidate for conventional surgical therapy
  - If outcome does not meet expectations, not much lost

Endovascular Treatment: TASC C/D Aortoiliac Disease

- Access:
  - Ipsilateral retrograde
  - Contralateral crossover
  - Bilateral femoral
  - Brachial access
  - Combined femoral/brachial approach
  - Hybrid approach: open femoral endarterectomy

- Crossing techniques:
  - Subintimal angioplasty
  - Re-entry devices
  - CTO devices

Potential Complications

- Vessel wall perforation
- Dissection
- Avulsion of vessel from aorta
- Embolization
- Access site complications

Chronic Left Common Iliac Artery Occlusion
**Chronic Left Common Iliac Artery Occlusion**

- Unable to cross from right femoral approach
- Left femoral access
- Kumpe catheter/glide wire, subintimal plane
- Multiple unsuccessful attempts to re-enter true lumen in aorta

**Re-entry device**

- Balloon-expandable kissing stents
- Additional self-expandable stent into L CIA
- Left brachial access
- Unsuccessful attempts at re-entry

- Combined left brachial and right femoral access: unable to re-enter true lumen

- Re-entry catheter used from right femoral access

- Kissing I-cast covered stents
- Wallstent into R external iliac artery

- Rupture of distal R CIA
Endovascular First for Treatment of TASC C/D Lesion

- Not a question of can we do it, but should we do it?

Systematic Review

- 19 nonrandomized studies with 1711 patients; 1329 with extensive AIOD
- All single center results, all retrospective, varied patient selection

Jongkind et al; JVS 2010

Technical success reported in all studies: range 86% to 100%
- Reasons for technical failure: inability to cross occluded segment, thrombosis after recanalization, iliac artery rupture

Jongkind et al; JVS 2010

Systematic Review

- No perioperative or 30-day mortality in 12 studies
- 7 studies reported mortality rate ranging from 1.2%-6.7%
Systematic Review

- 4- or 5-year primary patency rates: 60%-86%
- 4- or 5-year secondary patency rates: 80-98%

Jongkind et al; JVS 2010

Meta-Analysis of Endovascular Treatment of TASC C/D Lesions

- Sixteen articles: 958 patients with TASC C and D AIOD treated with endovascular therapy
  - Minimum of 10 cases/study
  - Procedural details
  - Immediate technical success
  - Primary patency
  - Included cases with primary as well as selective stenting
  - 8/16 studies included in previous systematic review

- Pooled estimate for technical success:
  - 92.8% (89.8%-95.0%)
- Primary patency at 12 months:
  - 88.7% (85.9%-91.0%)

Ye et al; JVS 2011
Endovascular Treatment of Extensive AIOD: Single Center Experience of 1712 Interventions

- 1712 procedures in 1184 patients to treat lesions in distal aorta and iliac arteries: 9/1996-12/2006
- Primary endpoint:
  - 1-year duplex-based primary patency
- Secondary endpoints:
  - Technical success
  - Secondary patency
  - TLR

Sixt et al; JEVT 2013

Endovascular Treatment of Extensive AIOD: Single Center Experience of 1712 Interventions

- 1337 interventions in iliac arteries; 292 involved aortic bifurcation, 83 in distal aorta/bifurcation
- 30 day mortality was 1.1%; mean F/U 3.24 years
- 12 and 24-month restenosis, TLR, and primary/secondary patency rates did not differ among TASC II A-D subgroups
- Outcomes for complex interventions in distal aorta or aortic bifurcation did not differ compared to total cohort

Sixt et al; JEVT 2013

Covered vs Bare Balloon Expandable Stents

- Freedom from restenosis, amputation, or surgery: better in TASC A+B compared to TASC C+D

Sixt et al; JEVT 2013

Covered vs Bare Balloon Expandable Stents

- Benefit of covered stents:
  - Reduce intimal hyperplasia
  - Less thrombogenic than BMS?
- Numerous reports demonstrate promising results
- One randomized trial: Covered Versus Balloon Expandable Stent Trial (COBEST)
  - 168 iliac arteries in 125 patients with TASC B/C/D lesions
  - Randomly assigned to receive Advanta V12 covered stent (Atrium) or commercially available bare metal balloon expandable stents
  - Follow-up at 1, 6, 12, and 18 months
**COBEST: Primary Outcomes**

- Freedom from binary restenosis
- Freedom from stent occlusion

*Mwipatayi et al; JVS 2011*

**COBEST: Freedom From Binary Restenosis***

- TASC C/D group
- TASC B group

*More TASC D lesions in covered stent group

*Mwipatayi et al; JVS 2011*

**DISCOVER Trial**

- Dutch Iliac Stent Trial: COVERed balloon-expandable versus uncovered balloon-expandable stents in the common iliac artery
  - Prospective, randomized, double-blind, multi-center trial
  - Symptomatic atherosclerotic disease of the CIA, defined as stenoses > 3 cm and occlusions
  - Randomized to Advanta V12 PTFE-covered stent or a balloon-expandable uncovered stent

- Primary endpoint:
  - Absence of binary restenosis rate

- Secondary endpoints:
  - Re-occlusion rate, TLR, clinical/procedural/hemodynamic success, major amputation, complication, mortality

**Comparison of Techniques for Extensive AIOD**

- Open surgery
  - Higher mortality
  - Higher morbidity, more significant
  - Better primary patency
  - Equal secondary patency
  - Increased length of stay
  - Limited by physiology
  - Sexual dysfunction, return to normal activity

- Endovascular Repair
  - Lower mortality
  - Lower morbidity, less significant
  - Lower primary patency
  - Equal secondary patency
  - Decreased length of stay
  - Limited by anatomy
Endovascular Treatment of TASC C/D AIOD

- Most (>90%) TASC C/D lesions can be successfully treated
  - Depends on how hard you want to work
- Liberal use of covered stents, especially difficult cases, long segment occlusions
- Be prepared for complications, usually rupture or dissection
- Long term patency may improve with regular use of covered stents

Conclusions

- Endovascular first approach TASC C/D:
  - High operator success rate
  - Significant patient co-morbidities
- Open surgery first approach TASC C/D:
  - Less experienced with complex endovascular techniques
  - Good risk, young patient
  - Juxtarenal aortic occlusion