Is it always necessary to stent the Celiac Artery in 4xFEVAR?

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Disclosures

• William Cook Europe/Cook Inc.
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• Getinge
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• Achieve sealing in juxta/suprarenal AAA by landing in healthy aorta
3x/4x FEVAR vs. 2x FEVAR
Theoretical Advantages

- More proximal sealing
  - Longer length
  - Healthier aortic wall

- Long term durability
  - Younger patients
Evolution of Stent-graft Design: Nürnberg series

↑ Use of Complex FEVAR over the years...
4xFEVAR

- Involves bridging stent in celiac artery
  - (often) Steep take-off & Angulation
  - Subject to respiratory motion
  - Median arcuate ligament
4xFEVAR without stenting CA

• Potential advantages
  – ↓ Complexity: 4xFEVAR → 3xFEVAR procedure
  – ↓ Duration of surgery
  – ↓ Radiation and iodinated contrast
  – ↓ Cost

New Strategy for J/SAAA
Elective 4xFEVAR

- Straight, non-aneurysmatic aorta between SMA and CA?
  - NO: Stenting CA
  - YES: Planned not to stent CA

  - Planned not to stent CA
    - Easy CA catheterization?
      - YES: Lateral Angio
        - CA perfusion and no Endoleak?
          - NO: CA not stented
          - YES: CA not catheterized
Case Example (1)

Elective J/SAAA

NO

Straight, non-aneurysmatic aorta between SMA and CA?
Case Example (1)

Elective J/SAAA

Straight, non-aneurysmatic aorta between SMA and CA?

Stenting CA

NO
Case Example (2)

- Elective J/SAAA
- Straight, non-aneurysmatic aorta between SMA and CA?
- Planned not to stent CA
- Easy CA catheterization?

YES

NO
Case Example (2)

Elective J/SAAA

Straight, non-aneurysmatic aorta between SMA and CA?

Planned not to stent CA

Easy CA catheterization?

NO

CA not catheterized
Case Example (3)

Elective J/SAAA

↓

Straight, non-aneurysmatic aorta between SMA and CA?

↓

Planned not to stent CA

↓

Easy CA catheterization?

↓

CA catheterized Lateral angio
Case Example (3)

Elective J/SAAA

Straight, non-aneurysmatic aorta between SMA and CA? YES

Planned not to stent CA

Easy CA catheterization? YES

CA catheterized

Lateral angio

CA perfusion and no Endoleak? YES
Case Example (3)

Elective J/SAAA

Straight, non-aneurysmatic aorta between SMA and CA?

Planned not to stent CA

Easy CA catheterization?

CA catheterized

Lateral angio

CA perfusion and no Endoleak?

CA not stented
Case Example (4)

Elective J/SAAA

Straight, non-aneurysmatic aorta between SMA and CA?  
YES

Planned not to stent CA

Easy CA catheterization?  
YES

CA catheterized  
Lateral angio
Case Example (4)

1. Elective J/SAAA
   - Straight, non-aneurysmatic aorta between SMA and CA?
     - YES
     - Planned not to stent CA
     - Easy CA catheterization?
       - YES
       - CA catheterized
         - Lateral angio
           - CA perfusion and no Endoleak?
             - NO
             - CA perfusion and no Endoleak?
               - NO
Case Example (4)

Elective J/SAAA

- Straight, non-aneurysmatic aorta between SMA and CA?
  - YES
  - Planned not to stent CA
    - YES
    - Easy CA catheterization?
      - CA catheterized
      - Lateral angio
        - CA perfusion and no Endoleak?
          - NO
          - Stenting CA
Case Example (4)

- **Elective J/SAAA**
- **Straight, non-aneurysmatic aorta between SMA and CA?**
  - **YES**
  - **Planned not to stent CA**
    - **YES**
      - **Easy CA catheterization?**
      - **CA catheterized Lateral angio**
        - **CA perfusion and no Endoleak?**
          - **NO**
          - **Stenting CA**
Patients

• January 2018 - March 2020

• Elective 4xFEVAR for Juxta/suprarenal AAA

• Excluded:
  – Ruptured AAA or acute indication for repair
  – TAAAs
  – Combination of branches/fenestrations/scallop
  – Preoperative occlusion of CA
Patients

- N=48
  - 46 males; mean age 72 ± 9 years
  - Previous open AAA repair: n=4 (8%)
  - Previous EVAR: n=7 (15%)
Pre- and Intraoperative Assessment

- Primary stenting: n=17 (35%)
- Planned not to stent: n=31 (65%)
  - Difficult catheterization: n=14 (29%)
  - Easy catheterization: n=17 (35%)
    - Good perfusion and no endoleak: n=13 (27%)
    - Inadequate perfusion: n=3 (6%)
    - Endoleak: n=1 (2%)
Postoperative Results

• Overall Technical success: N=47 (98%)
  – failure: Left renal artery occlusion in a patient with previous open repair

• No open conversion, spinal cord ischemia or mortality in first 30 days
Follow-up
Median FU: 8 months (range 1-25)

• No CA-related endoleaks or reinterventions
• No aneurysm related deaths

• CA occlusion: N=2 (6 and 13 month, both asymptomatic)
  – Both patients: CA not catheterized/not stented
    • Patient 1: long high-grade stenosis on preoperative CTA
    • Patient 2: very steep take-off of the CA/long distance between SMA-CA

• Estimated primary patency of CA at 12 months: 95.8 ± 4.1%
Conclusions

• 4xFEVAR without stenting of the CA: Safe and effective strategy in selective patients

• Catheterization and intraoperative Angiography in suitable CA is helpful to make the final decision to use a stent.