Update On The CERAB Procedure (Covered Endovascular Reconstruction of Aortic Bifurcation) For Aorto-Iliac Occlusive Disease: Technical Tips, 3-Year Results, What Is The Best Stent-Graft For This Procedure

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Covered Endovascular Reconstruction of the Aortic Bifurcation - CERAB

Goal: to provide a more anatomical and physiological endovascular reconstruction of the aortic bifurcation

BM Kissing stents; turbulence and recirculation at phases B and C

Suboptimal placed limbs:
• Inferior stent-to-wall apposition (Double-D configuration)
• 4-fold increase in mismatch area

Clinical results of CERAB

Midterm outcome

- February 2009 – July 2016
- 130 elective patients, two centers
- Age 61 (36-81) years, 69 male
- Chimney procedures excluded
- Previous aorto-iliac intervention in 41%

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TASC II classification:
- B n=7 (5.4%)
- C n=7 (5.4%)
- D n=136 (95.2%)

Rutherford classification:
- 1 n=1 0.8%
- 2 n=0 0.0%
- 3 n=84 66.1%
- 4 n=22 17.3%
- 5 n=18 14.2%
- 6 n=2 1.6%

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Complications

- Procedural
  - Unintended dissection n=6
  - Bleeding n=4
  - Stent dislocation n=1
  - Stent deformation n=2
  - Thrombus formation
- Post Procedural
  - Pneumaturia n=5
  - Thrombus n=3
  - CFA occlusion n=1
  - NIDUS n=1
  - Renal insufficiency n=1
- No 30-day mortality

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Median follow-up 24 months
- Total primary patency
  - 12 months 91%
  - 24 months 89%
  - 36 months 87%
- Secondary patency
  - 12 months 97%
  - 24 months 97%
  - 36 months 97%
- Clinical improvement at 36 months 96%
- Limb salvage rate at 36 months 97%

Clinical results of CERAB

Role of outflow stenosis

HD significant outflow stenosis causes:
- 2-fold decrease in peak outflow velocity
- 3-fold decrease in TA-WSS in both CERAB and control

In CERAB the TA-WSS was 2-fold lower compared to the control model, independent of the lesion severity

Outflow stenosis after CERAB will have a higher tendency to progress in time and may require early treatment

HD significant outflow stenosis after CERAB will have a higher tendency to progress in time and may require early treatment


Outflow stenosis after CERAB will have a higher tendency to progress in time and may require early treatment

Clinical results of CERAB

Midterm outcome

Previous treatment of AIOD
- Surgical reconstruction of the aortoiliac segment (n=7):
  - Endovascular intervention (n=40, 35%)
    - 46% PAs of the common iliac artery
    - 37% Stent of the common iliac artery

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Clinical results of CERAB

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Clinical results of CERAB

Renal protection

• 14 consecutive patients in three centers
• 11 male with mean age 61.2±8.9 years
• 12/14 TASC D lesions
• 15 chimney grafts
  - inferior mesenteric artery (n=8)
  - right renal artery (n=4)
  - left renal artery (n=3)
• Technical success 100%
• Follow-up: 12 months (range 6–24)
• Patency
  - CERAB 100%
  - Chimney 93%


Use of chimney grafts

- CERAB is related to the most optimal geometry and flow patterns
- Clinical outcome is good up to three years follow-up with very few late failures
- Proper placement of the limbs and treatment of outflow stenosis are important to improve outcome
- Endovascular options seem unlimited, but the preferred treatment remains tailor made, particularly in complex cases

Summary

• CERAB is related to the most optimal geometry and flow patterns
• Clinical outcome is good up to three years follow-up with very few late failures
• Proper placement of the limbs and treatment of outflow stenosis are important to improve outcome
• Endovascular options seem unlimited, but the preferred treatment remains tailor made, particularly in complex cases

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