Treatment of Popliteal Aneurysm
Endo or Open?

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Disclosure

Speaker name:
Jürgen Verbist

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

☑️ I do not have any potential conflict of interest
TREATMENT OPTIONS

Goals
1. prevent thromboembolic events
2. maintain or restore distal circulation
3. avoid further aneurysmal saccular expansion

OPEN versus ENDO?
TREATMENT OPTIONS

1. Open surgical repair

A. Medial approach

- familiar to all vascular surgeons
- easy harvesting of vein
- small risk of nerve injury,…

Pro

Contra

- no saccular decompression
  -> 30% “endoleak” with risk of saccular growth
  -> pain, compression symptoms
TREATMENT OPTIONS

1. Open surgical repair

A. Medial approach

- 5 year patency rates
  primary 69% - 76%
  secondary 87%

- PTFE versus vein
  comparable patency for short grafts

- limb salvage rate 87% - 97%

- reintervention rate for PAA recurrence significantly lower (0%) after endoaneurysmorrhaphy

TREATMENT OPTIONS

1. Open surgical repair

B. Posterior approach

- saccular decompression

 Pro

- limited exposure
- harvesting of GSV is more difficult
- sural, tibial and common peroneal nerve injury

 Contra
TREATMENT OPTIONS

1. Open surgical repair

   B. Posterior approach: **Beseth**

   n = 30 (retrospective review)
   - another 13 PAA’s treated by medial approach
   - PTFE (n= 25) or Dacron (n= 5)

   - 2 years primary patency = 92.2%
     secondary patency = 95.8%

   - Limb salvage 100%

1. Open surgical repair

B. Posterior approach: **Ravn**

n = 717 treated PAA’s (registry)
→ Posterior approach 57
→ Medial approach 390

Postop saccular expansion rate: 8.3% (posterior)
33% (medial)

*Ravn H, Wanhainen A, Björck M. Surgical technique and long-term results after popliteal artery aneurysm repair:
TREATMENT OPTIONS

2. Endovascular repair

Viabahn W.L. GORE & Associates
TREATMENT OPTIONS

2. Endovascular repair

- minimal invasive
- less complications
- shorter hospital stay

Pro

- anatomical considerations
- saccular decompression

Contra
2. Endovascular repair: Cina

cumulative summary of studies (OR versus ER)

<table>
<thead>
<tr>
<th></th>
<th>ER</th>
<th>OR</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1Y</td>
<td>3Y</td>
</tr>
<tr>
<td>Prim patency</td>
<td>83%</td>
<td>74%</td>
</tr>
<tr>
<td>Sec patency</td>
<td>86%</td>
<td>85%</td>
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No difference in primary patency between OR and ER

J Vasc Surg 2010; 51:1056-60
TREATMENT OPTIONS

2. Endovascular repair: Tielliu

Prospective cohort study for ER

n = 67 PAA’s in 57 patients

<table>
<thead>
<tr>
<th>ER</th>
<th>1Y</th>
<th>2Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prim. patency</td>
<td>80%</td>
<td>77%</td>
</tr>
<tr>
<td>Sec. patency</td>
<td>90%</td>
<td>87%</td>
</tr>
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</table>
TREATMENT OPTIONS

2. Endovascular repair: Tielliu

Conclusion:

→ Patency rates of ER slightly inferior to OR

→ Treatment with clopidogrel was the only predictor for success (n=18, patency 100%, p=0.008)
TREATMENT OPTIONS

2. Endovascular repair: **Antonello**

Prospective Randomized study compared OR with ER

n= 30 limbs in 26 patients

<table>
<thead>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1Y</td>
<td>2Y</td>
</tr>
<tr>
<td>Primary</td>
<td>87%</td>
<td>80%</td>
</tr>
<tr>
<td>Secondary</td>
<td>100%</td>
<td>100%</td>
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</table>

TREATMENT OPTIONS

2. Endovascular repair: Antonello

Prospective Randomized study compared OR with ER

- No statistical difference of primary and secondary patency in the long term

- Significantly shorter mean operation time and hospital stay for ER

Attention: power limitation!
Asymptomatic
- Ø > 3 cm: OR/ER
- Ø = 2-3 cm: Thrombus/distal embolisation → OR / ER
- Ø < 2 cm: No thrombus → Follow-up

Symptomatic
- Acute ischemia
  - Ø > 3 cm: Viable limb → OR
  - Ø ≤ 2 cm: Jeopardized limb → OR

- Chronic ischemia
  - Rutherford < 3: Cfr. asymptomatic
  - Rutherford ≥ 3: OR/ER
PATIENT TAILORED APPROACH

Acute ischemia

- > limb threatening ischemia
  - open outflow vessels:
    open repair (bypass)
  - no outflow vessels:
    open repair (bypass + thrombectomy or thrombolysis on table)

- > viable ischemia
  - thrombolysis prior to open/endovascular repair?
    acute deterioration (13%)
    improvement of runoff (87%)

## PATIENT TAILORED APPROACH

<table>
<thead>
<tr>
<th></th>
<th>good</th>
<th>bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access vessel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesion length &gt; 20 cm</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Tortuosity</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Prox/distal landing zone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>good</td>
<td>bad</td>
</tr>
<tr>
<td>Ø Discrepancy</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Symptoms of compression</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Outflow vessels</td>
<td>good</td>
<td>bad</td>
</tr>
<tr>
<td>Antiplatelets contraindicated</td>
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<td>yes</td>
</tr>
<tr>
<td>Active patient</td>
<td>no</td>
<td>yes</td>
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Conclusion

Endovascular repair of PAA in patients with suitable anatomy ....

... results in primary and secondary patency rates in range with open surgery

... leads significantly shorter operative time and hospital stay

Open repair has still an important place in the treatment of PAA, based on clinical and anatomical considerations.