Percutaneous coil embolization of the feeder vessels, in a previously excluded symptomatic popliteal aneurysm

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Disclosure

Speaker name:  Ahmed Khairy

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
Introduction

- Popliteal artery aneurysms (PAAs) represent the most common peripheral arterial aneurysms, 70% - 80%

- About 50% of PAAs are bilateral, usually affecting elderly men and it may be associated with aneurysm disease elsewhere e.g. AAA (>40%)

- 80% of PAAs are asymptomatic at the time of diagnosis; over time many become symptomatic at a rate of 14% per annum (Hingorani 2009)
Complications:

70% over five years (Parodi 1991)

- **Thrombo-embolism**
  - The commonest presentation (50%)
  - Limb loss (20-40%)

- **Compression** (typically with larger aneurysms >3cm):
  - Nerve: pain, paraesthesia
  - Vein: popliteal vein thrombosis

- **Rupture**
  - Posterior, rare (2-3%)
Endovascular versus open repair of asymptomatic popliteal artery aneurysm

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Review context and aims: The evidence on endovascular repair versus open surgical repair is still considered as the gold standard treatment.

Objective/Background: The evidence on endovascular repair versus open surgical repair remains inconclusive. Here, findings from the last two decades of endovascular repair and open surgical repair are compared. The results suggest that patient outcomes after endovascular repair may be equal to open surgical repair, and the endovascular technique appears to be a viable alternative to open surgery. Nevertheless, current evidence on endovascular repair is limited and further research is recommended.

Methods: The PubMed and Cochrane Central Register of Controlled Trials were searched for publications that compared outcomes after endovascular repair and open surgical repair. Randomized controlled trials (RCTs) with prospective and retrospective observational cohort studies were included. The quality of studies was evaluated using the Newcastle–Ottawa scale and the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. Random-effect models were employed to estimate odds ratios (ORs), mean differences, and hazard ratios (HRs).

Results: One RCT combined with a prospective cohort study and four retrospective cohort studies with an overall evidence level of moderate.

EVR may be a safe and efficient method with a good midterm patency rates comparable with OSR but, with a higher re-intervention and thrombosis rates.

For evidence based recommendations on EVR further research is absolutely necessary.
No difference was shown in patency between OR with the medial or posterior approach.

The main advantage of the posterior approach is the decreased risk of late expansion.

20-30% of PAAs may continue to expand due to retrograde filling through collateral vessels (Type II endoleak after EVAR).
Case presentation

93-year-old gentleman presented with asymptomatic left PAA, 4x3.7cm as shown in CTA
Initial Management

In February 2014, open surgery was performed:
Aneurysm exclusion with a reversed saphenous vein bypass

After 2-year period of follow up, the patient noticed left leg pain and swelling for 6 weeks that became increasingly severe in the 7-days prior to admission
Physical examination

- Large pulsatile mass in the popliteal fossa
- Absent pedal pulses
- Ankle-brachial pressure index (ABPI) was 0.6 on the ipsilateral extremity and 0.9 on the contralateral extremity
Treatment options for symptomatic excluded PA

1- Open repeat exploration:
   Require a good surgical risk patient
   Disadvantages:
       Nerve, vein, or lymphatic damage, and anesthesia risk

2- Endovascular Role:
   Safer, alternative procedure
   Derived from the aortic endograft experience
   Involves catheter directed injection of a prothrombotic agent
Injectable materials used for this technique include

Thrombin
Van den Berg et al., AJR 2000

Ethylene-vinyl-alcohol copolymer
Martin ML et al., J Vasc Interv Radiol 2001

Biologic glue, Lipiodol, Microcoils
Piazza, et al., JVS 2016. Pages: 32

Absorbable thrombogenic sponge
Walker SR et al., Br J Surg 1999
Follow up:

Clinical
Post-operative color flow Doppler
Conclusion

- Percutaneous coil embolization should be considered a safe procedure that significantly minimized the operative and anesthesia risk in this nonagenarian patient.

- Follow-up surveillance duplex is mandatory to assure:
  - Aneurysm sac exclusion and thrombosis
  - Bypass graft patency
  - Follow up associated aneurysms
Despite its initially promising results, it needs:

- Large long-term follow-up; to confirm its efficiency
- Good endovascular experience and facilities to be available for proper management and satisfying results
Thank you

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