Rare cause for acute lower limb ischemia after unilateral internal iliac artery embolism for EVAR: Type IIb persistent sciatic artery

By Dr KK Wong
Chief of Vascular Service
Tuen Mun Hospital & Pok Oi Hospital
Hong Kong, China
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Disclosure

Speaker name: Kei Kwong, Wong

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
Patient’s history

-M/78
-Chronic smoker
-ADL independent, walks unaided

-Past History:
-hypercholesterolemia
-BPH
-small bladder and L ureteric stone
-IHD
-GU with repeated biopsy: high grade dysplasia
Patient’s history

-patient was referred to us in early April, 2016 by both urologist and upper GI surgeon for early management of incidental found 68mm max. diameter infrarenal AAA by private plain CTU and CT A&P for suspected ca stomach

-clinically asymptomatic

-EUS by GI Surgeon: highly suspected Ca Stomach and was planned to have early gastrectomy

-P/E:

-7cm pulsatile abdominal mass

-bilateral LLs’ circulation well with normal femoral and popliteal pulses
Pre-op CT x Ca Stomach Staging
Pre-op Doppler USG CFAs/ SFAs/ Profunda Artery

R Side                                            L Side
Pre-op Doppler USG CFAs/ SFAs/ Profunda Artery

R Side                                            L Side

Dist 1  10.5 mm  Dist 2  8.77 mm
Dist 1  7.12 mm  Dist 2  5.50 mm
Both common iliac arteries (CIA) measured significantly shorter in Asians, particularly on the right side.

The mean RCIA and LCIA lengths were 29.9 (8-70)mm and 34.2 (15-80)mm, respectively (25.7 (8-55) and 34.1 (15-80) mm for CIAs <20 mm in diameter), compared to >50mm in Caucasians (p<0.001).

Internal iliac artery coverage with or without embolization was necessary in 51% of endovascular repairs due to short (16%) or aneurysmal CIAs (35%).
Ways to deal with Internal Iliac Arteries (IIA) during EVAR for patients with short or aneurysmal CIAs

(I) Sacrifice the IIA by “LEC”
- ligation
- coils embolization
- simple coverage the IIA origin by stent graft
Ways to deal with Internal Iliac Arteries (IIA) during EVAR for patients with short or aneurysmal CIAs

(II) Preservation of IIA
- Bell-bottom grafts
- EIA-to-IIA open bypass
- EIA-to-IIA endograft (AUI + cross femoral bypass)
- Bifurcated limb extension to IIA (axillary approach + EIA ligation + cross femoral bypass)
- Sandwich Technique (axillary approach)
- Crossover Chimney Technique
- Crossover Sandwich Technique (use Endologix AFX endografts)
- Iliac branch device
Pre-EVAR Planning
R Iliac Arteries
L IIA Coils Embolization
一失足成千古恨
(last of leg / a single slip resulted into sorrow for a thousand years)
A moment's mistake will bring about sorrow for ages
L LL’s on-table angiogram
Pre-op. CT (venous phase) review
Pre-op CT (venous phase) review
Post-EVAR LLs’ CTA
Post-EVAR LLs’ CTA
Post-EVAR LLs’ CTA
Persistent Sciatic Artery (PSA)

- First reported by Green in a post mortem case in 1832
- First description of a PSA aneurysmal degeneration by Fagge in 1864
- Embryological studies by de Vriesse 1902 & Senior 1919
Fig. 5. Major arterial supply to lower limb bud in early development is sciatic (or axial) artery, continuation of internal iliac artery (A). After 22 mm stage, femoral artery has usually developed into major artery, making connection with popliteal artery while most of the sciatic artery regresses (B). After complete development (C), remnants of sciatic artery normally persist as popliteal and peroneal arteries (shaded regions); course of persistent sciatic artery is illustrated (skipped segments).
PSA Classification
(Pillet et al, modified by Gauffre et al.)
PSA Classification (Bower et al)

1/ Complete type
   - when the PSA is the main blood supply to the lower limb
     - SFA is mostly hypoplastic and ends in the thigh

2/ Incomplete type
   - the SFA is the main blood supply to the popliteal artery
     - PSA is usually hypoplastic and terminates in the thigh
PSA

- Rare with estimated incidence 0.025-0.06%
- <200 cases described in the literature
- 30% bilateral
- 80% complete type
- High incidence of complications:
  - >50% with aneurysm
  - >80% with LL’s ischemia due to stenosis, thrombosis & distal embolization
Lesson to learn

- The PSA pathognomonic Cowie’s sign (absent femoral pulse in combination with a palpable popliteal pulse) is found only in a few PSA cases which requires a hypoplastic iliofemoral arterial system with a complete PSA

- Important to have formal pre-op. CTA study to include iliac & femoral arteries before EVAR, especially for patient planned to sacrifice IIA

- Think about PSA when there is significant size difference in bilateral iliac arteries
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