What Is New In The Treatment Of External Iliac Artery Endofibrosis In Committed Cyclists: Is There A Role For Endovascular Treatment?

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Disclosures

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External Iliac Artery Endofibrosis

- High performance athletes
  - Cyclists most typical, but runners, skaters, skiers…
  - L leg > R, may be bilateral
- Characteristic lesion
  - Distinct from atherosclerosis, FMD, cystic adventitial disease
  - Circumferential or eccentric
- Most common location proximal external iliac artery
  - Other arteries involved: femoral>common iliac

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Endofibrosis

- Hyperflexion at the hip
  - Repetitive stretch
- Arterial fixation
  - Inguinal ligament, hypogastric, psoas branches
- Psoas muscle impingement
  - Combination of hypertrophy and fixation
- Arterial redundancy
  - Kinking with or without endofibrosis
- Dynamic: vasospasm

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Treatment

Conservative measures:
- Often unacceptable to patients, small risk of progression/occlusion

Surgical approaches: Controversy!
- Interposition graft
- Patch angioplasty +/- endofibrosectomy
- Vessel shortening
- Iliac release, inguinal ligament release
- Endovascular: no role as primary therapy

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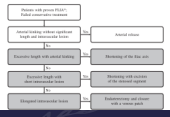
Endofibrosis

- Van Hooff et al JVS 2023: Endarterectomy and patch
  - 68 pts/79 limbs
  - 55.7% male, ave age 34
  - Postop: 91.2% sx improvement, 93.7 % satisfaction
  - Post-exercise ABI .34 → .59
  - Long term: 94.5% sx improvement, 91.7% satisfaction
  - 2 saphenous vein patch dilation



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Mayo/Virginia Experience

2002

Obstructive external iliac arteriopathy in avid bicyclists: New and variable histopathologic features in four women

2012

Results of external iliac artery reconstruction in avid cyclists

2020

Chasing Perfection: The Surgical Treatment of External Iliac Artery Arteriopathy in High-Performance Athletes

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UVA Experience: 2004-2019

- Single institution: 75 patients (102 limbs) – 36% bilateral
- 26 Males (35.7%) vs. 49 Females (65.3%)
- Age – 40.35 years at intervention (range 22.3 – 56.1)
  - Start training – 23.74 years
  - Symptom onset – 35.89 years
- Prior intervention at other institutions – 8 limbs (7.8%)

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Outcomes

Survey Data: Patient-Reported Outcomes

- Response rate – 43% (32/75 patients)
- Pain Score
  - Pre-operative – 7.38
  - Postoperative – 3.38
- Return to full training – 71.87%
- Any symptom persistence/recurrence – 22 (68.75%)
- Helpfulness in relieving symptoms – 7.16
- Pursue surgery again – 28 (87.5%)

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Reintervention

Interposition – 19/56 limbs (33.9%)
- Proximal Intimal Hyperplasia – 3/19 limbs
- Distal Intimal Hyperplasia – 11/19 limbs
- Kinking – 2/19 limbs

Patch angioplasty – 6/30 limbs (20%)
- Distal Intimal Hyperplasia – 2/6 limbs
- Kinking – 4/6 limbs

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Controversy!

Short- and long-term results of operative iliac artery release in endurance athletes

Surgical shortening of lengthened iliac arteries in endurance athletes: Short-term and long-term satisfaction

Short- and long-term outcomes after endarterectomy with autologous patching in endurance athletes with iliac artery endofibrosis

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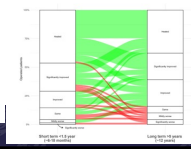
Shortening

Surgical shortening of lengthened iliac arteries in endurance athletes. Short-term and long-term satisfaction

- Van Hoofff et al JVS 2022: Shortening only
  - 83 pts/90 limbs
  - 96.7% male, ave age 34
  - 2 prior arterial release, 2 went on to patch, 1 stent*
  - Postop: 87.5% sx improvement, 86.4% satisfaction
    - 10% same sx
    - 25.7% slight improvement
    - 50% large improvement
  - Post-exercise ABI .55 → .62 (!)
  - Long term: 84.1% sx improvement,81.2% satisfaction

Fig 2. Surgical shortening of the external iliac artery.



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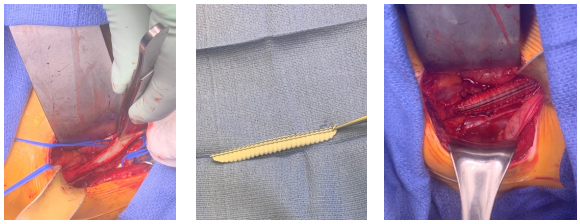
Release

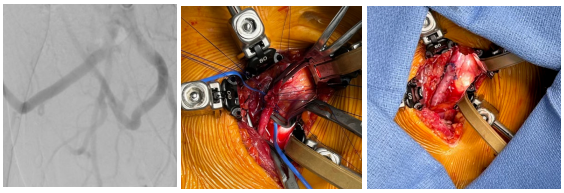
- Van Hooff et al JVS 2022: Release only
  - 142 pts/155 limbs
  - 88.4% male, ave age 24
  - Postop: 83% sx improvement, 80% satisfaction
  - Post-exercise ABI .53 → .57
  - 34% with residual kinking, mostly asx
  - Long term: 63.9% sx improvement, 59% satisfaction
  - 8 reinterventions
  - Same interval:
    - 90 limbs/83 pts shortening only
    - 79 limbs/68 pts endarterectomy/patch

Patch Repair

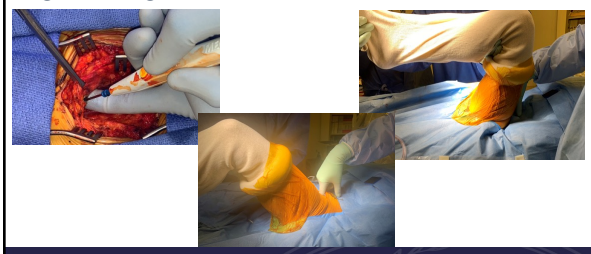


Interposition Graft

Shortening



Inguinal Ligament Release



Role of Endovascular Therapy

CASE REPORTS

Endofibrosis of Iliac Arteries in High-Performance Athletes: Diagnostic Approach and Minimally Invasive Endovascular Treatment

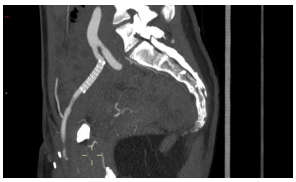
Angioplasty

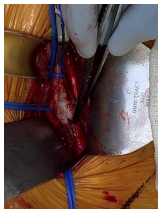
- Should not be used de novo.
- May be suitable for mild and moderate post-operative stenoses.
- Likely not durable result
- Avoid in severe hyperplasia. Lesion disruption may lead to worsening of symptoms, including acute thrombosis and embolization.

Stenting

- NO. Extremes of flexion, stretch. Prone to vasospasm.

Endovascular Treatment- Don't Be That Guy…





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External Iliac Arteriopathy: Key Points

- Overall, most return to sport, high satisfaction
- Durability? Relatively high rate of reintervention long term
- BAD complications possible
- Genuine controversy:
  - Diagnostics and algorithm
  - Subtypes (and combinations)
  - Technique
- Endo: *Still "No!"*

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