Infrarenal abdominal aortic subintimal angioplasty and stenting for infrarenal aortoiliac occlusions

Christopher L. Stout MD, FACS
Assistant Professor Eastern Virginia Medical School Division of Vascular Surgery
Disclosure

Christopher L Stout MD

I have the following potential conflicts of interest to report:
Speaker: CSI, Cordis, Gore
Subintimal angioplasty of chronic total occlusion in iliac arteries: A safe and durable option

Brian L. Chen, MD, Harry R. Holt, BS, Jarrod D. Day, MD, Christopher L. Stout, MD, Gordon K. Stokes, MD, and Jean M. Panneton, MD, Norfolk, Va

Background: Traditionally, aortobifemoral bypass has been the intervention of choice for iliac artery chronic total occlusions (CTOs). However, it is associated with significant morbidity and mortality, limiting its use in high-risk patients. To reduce procedural risk, subintimal angioplasty (SIA) for femoropopliteal CTO has been utilized by many, but few have extended this endovascular technique to treating iliac artery CTOs. We present our experience with 101 successful SIA for iliac artery CTOs.

Methods: A retrospective review of consecutive patients with iliac artery CTOs treated with subintimal angioplasty from June 2000 to January 2009 was completed. Demographic and risk factor data were obtained, along with procedural data. Primary and secondary patency, survival, freedom from claudication, and limb salvage rates were determined by Kaplan-Meier survival analysis. Univariate and multivariate analyses were completed to identify factors adversely affecting primary patency.

Results: One hundred twenty patients underwent an attempted SIA of an iliac artery CTO, and 101 iliac artery CTOs were successfully treated, giving a technical success rate of 84%. Technical failure was due to the inability to re-enter the lumen in all cases. Indications for intervention were lifestyle-altering claudication in 64 patients (63%) and critical limb ischemia (CLI), in 37 (37%). Eighty-five patients underwent percutaneous SIA, while 11 patients underwent a combined SIA with surgical outflow procedure. Lesions were classified as TransAtlantic InterSociety Consensus (TASC) B, 39 (39%); TASC C, 27 (27%); and TASC D, 35 (35%). In 82 (81%) lesions, stents were deployed with an average of 1.2 (range, 0–3) stents utilized. A re-entry device was used in 14 (14%) lesions. Major complication rate was 3.0%, with a 30-day mortality rate of 1.0%. Primary and secondary patency rates at 1, 2, and 3 years were 86% and 94%, 76% and 92%, and 68% and 80%, respectively. Survival rate was 67% at 5 years, reflecting the poor health of this cohort. Limb salvage for CLI patients at 1 and 5 years was 97% and 95%, respectively. Freedom from claudication at 1 and 3 years was 89% and 73%. Univariate analysis identified hyperlipidemia, coronary artery disease, and prior surgical bypass in treated limb as factors for loss of primary patency; however, on multivariate analysis, no factors remained statistically significant.

Conclusion: This study demonstrates that SIA of iliac CTOs is feasible and can be performed safely and effectively, even in high-risk patients. Excellent patency and limb salvage rates can be achieved. In our experience, the safety and durability of SIA makes it an attractive first-line therapy for iliac artery occlusive disease. (J Vasc Surg 2011;53:367-73.)
Infrarenal aortic occlusion

- 54 yo male non-smoker with inability to walk around house due to claudication.
- PMHx: Neuromuscular disorder where he cannot have anesthesia.
- Was told no options by multiple VS

<table>
<thead>
<tr>
<th>ABI</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.64</td>
<td>0.57</td>
</tr>
</tbody>
</table>
1. Left brachial 4F and bilateral femoral 7F percutaneous access
2. Retrograde SIA of iliacs and aorta
3. Balloon PTA of iliacs to get catheters to track
4. Took loop out of glidewire and used BER catheter to direct re-entry at right renal
5. After confirmation angiogram placed Rosen wires
6. Icast stents deployed exactly at right renal
7. Viabahn Stent grafts extended down (use for length)
8. Non-compliant post dilation
Subintimal plane begins at circumflex iliac vessels – Deploy Viabahn’s down to normal artery but I try to maintain patency of these.
Completion AP View: Renals Remain Patent and stents shifted plaque laterally (I could have “snorkeled” the right renal if needed.)
Did well & discharged day after procedure. Continues without claudication at 6 months and patent stents on duplex. [ABI minimal improved (SFA CTO’s).]

Right ABI 0.71

Left ABI 0.67
United States Navy Wife

- 55 y.o. female w/ severe aching and burning pain in the bilateral buttocks, thigh and calf muscles with walking 0.5 blocks. The discomfort is relieved after resting. She is now having rest pain, notes some crusting of toes on R foot. She has no tissue loss. Smoker.

- Prior Surgery – **R nephrectomy**, CABG, PCI – stenting of CAB, hysterectomy

- Refused Aortobifemoral bypass
  - Husband deployed
  - Prior abdominal surgery
  - Not want another scar
Aortic Subintimal with Pioneer IVUS Re-entry on Right...
Puff to confirm true lumen then sequential quickcross /wire upsizing to 0.035
Repeat for Left... Careful of where renal is when SIA of aorta
ICAST Aorta and CIA and Viabahn EIA (Length)
• 100% Technical Success Rate using re-entry devices vs 77% without, p=sig

• 30d Mortality rate was 0% using re-entry devices vs 10% without, p=sig