New Tips and Tricks for Managing Acute Limb Ischemia: Value of Duplex Ultrasound in this Setting

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Value of Duplex Ultrasound with ALI

1. Gaining Access in (Retrograde) CFA to start the case
   - Essential in ALI to prevent bleeding at groin site
   - Single Anterior wall access
   - Avoid accessing PFA/SFA
   - Avoid hitting branches off CFA

2. When Needed, Accessing the Bypass Graft Directly
   - (i.e., Ax-Fem Bypass graft in crisscross fashion)

3. Finding the Origin of the Bypass Graft on the Contralateral CFA

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> Attache Group PLLC, Owner

Dilemma: When Treating ALI, Where is the Bypass Graft Origin?

> When starting an acute arterial occlusion case, how can you find and engage the targeted occluded bypass graft to begin catheter directed treatment (TPA, Mechanical Aspiration, etc)?

When the stump is identified:
OK, just engage with Catheter and Wire

Dilemma: What to do with flush bypass occlusions at the CFA?
Dilemma: Where is the Bypass Graft Origin?
- Despite different projections, hard to tell the origin of the graft from the SFA/PFA?
- Especially in patients with previous surgery/bypass grafts.

Ultrasound Evaluation of the right groin
Longitudinal View:
- Under ultrasound guidance, place a small needle near the origin of the bypass graft
- Do not engage graft

Technique: Ultrasound Placement of Needle to Mark Bypass Graft Origin
- Under ultrasound guidance, place a small needle near the origin of the bypass graft
- Do not engage graft.

Thrombolytic Therapy: Next day
- Placement of the infusion catheter (EKOS) used in this occluded bypass graft.
- Next day, start and running off the CFA after thrombolytic therapy with angioplasty determines.
- Patent to anterior tibial artery.

Second Case
- Initial angiogram of left groin in patient with history of occlusion of left posterior tibial graft. See marked occlusion and posterior tibial graft.
- Following morning angiogram reveals thrombus in left posterior tibial graft. Advanced an infusion catheter and thrombolysis administration overnight.
- Placement of the infusion catheter (EKOS) used in this occluded bypass graft.
**ALI at Audie Murphy VA Hospital**

**2014-2017**

**DEMOGRAPHICS**

<table>
<thead>
<tr>
<th>Number (%):</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male:</td>
<td>26</td>
</tr>
<tr>
<td>Average Age Range (49-74):</td>
<td>64.4</td>
</tr>
<tr>
<td>Hypertension:</td>
<td>21 (81%)</td>
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<tr>
<td>Hyperlipidemia:</td>
<td>21 (81%)</td>
</tr>
<tr>
<td>Coronary Artery Disease:</td>
<td>17 (65%)</td>
</tr>
<tr>
<td>Diabetes Mellitus:</td>
<td>14 (54%)</td>
</tr>
<tr>
<td>Smoking History:</td>
<td>11 (42%)</td>
</tr>
<tr>
<td>CVA:</td>
<td>4 (15%)</td>
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<tr>
<td>Previous Bypass:</td>
<td>4 (15%)</td>
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<tr>
<td>Venous (DVT):</td>
<td>3 (12%)</td>
</tr>
</tbody>
</table>

**26 Cases of ALI**

- 15 (58%) bypass grafts
- 3 (20%) venous grafts
- 1 (8%) PTFE

Ultrasound needed to gain access: 6 Cases (23%)
Ultrasound not needed: 9 Cases (35%)

15 (58%) bypass grafts
- 3 (20%) venous grafts
- 1 (8%) PTFE

**Future of Ultrasound in PAD**

- Using Ultrasound to Navigate Occlusions
- Use ultrasound to locate intraluminal pathway through total occlusions

**ALI at Audie Murphy VA Hospital**

**2014-2017: RESULTS**

- Ultrasound was used successfully in all 26 ALI cases in gaining arterial access.
- 6 Arterial Flush Occlusion Cases
  - 2 were saphenous vein bypass grafts and 4 were prosthetic bypass grafts (easier to see)
  - 4 were from the contralateral femoral and 2 from antegrade femoral access
- Technical Success: 5/6 Cases (83%)
  - For these 6 flush occlusion cases, ultrasound useful in finding the origin of all the occluded grafts guidance.
- We could get through the occlusion and begin therapy in 3 of the 6 grafts
- Time to access varied between 5-15 minutes.

**Discussion**

- Ultrasound is a valuable and crucial tool of treating Acute Arterial Occlusion cases
- It is essential when gaining femoral access, both antegrade and retrograde
- It is very helpful in gaining access into the targeted bypass graft when needed
- Watch out for bleeding at the side
- With flush occlusions of the bypass graft (both saphenous and prosthetic), ultrasound is very helpful in finding the graft origin and gaining access into the occlusion.