Treating Radial Artery Access Complications

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### Table 1  Comparison of radial and femoral procedures

<table>
<thead>
<tr>
<th>Access failure (n, %)</th>
<th>Radial (n=1000)</th>
<th>Femoral (n=727)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Allen</td>
<td>51 (7.3)</td>
<td>0 (2.1)</td>
</tr>
<tr>
<td>Vascular anatomy</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Puncture failure</td>
<td>12 (1.2)</td>
<td>4 (0.5)</td>
</tr>
<tr>
<td>Coronary canulation failure</td>
<td>4</td>
<td>2 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vascular access site complications (n, %)</th>
<th>Radial (n=1000)</th>
<th>Femoral (n=727)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfusion</td>
<td>0 (0.0)</td>
<td>4 (4.3)</td>
</tr>
<tr>
<td>Vascular intervention</td>
<td>0 (0.0)</td>
<td>6 (0.8)</td>
</tr>
<tr>
<td>Infection</td>
<td>3 (0.3)</td>
<td>2 (0.3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean (±SD) fluoroscopy time (mins)</th>
<th>Radial (n=1000)</th>
<th>Femoral (n=727)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>6.1 ±4</td>
<td>5.5 ±5</td>
</tr>
<tr>
<td>Interventional</td>
<td>14.6 ±5</td>
<td>13.2 ±4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean (±SD) procedure duration (mins)</th>
<th>Radial (n=1000)</th>
<th>Femoral (n=727)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>26 ±3</td>
<td>22 ±6</td>
</tr>
<tr>
<td>Interventional</td>
<td>48 ±20</td>
<td>51 ±23</td>
</tr>
</tbody>
</table>
Radial artery spasm

- 14.7% of the transradial cases.
- Hydrophilic sheaths and intra-arterial vasodilators has significantly decreased its overall incidence.
- Inadequate sedation or vasodilatation, repeated access attempts, rapid advance and exchange of catheters, small radial arteries appear to be the most common causes of spasm.

Extreme subclavian artery tortuosity in a patient with arteria lusoria.
Radial artery loop
Ulnar artery access
Radial artery loop
Radial artery loop
Radial artery loop
Stenosis
Perforation

- The Incidence is 1%
- Caused by forceful manipulation of hydrophilic wire, sheath or catheter
Perforation
Following POBA
Hematoma

• The incidence is 14.4%
• Usually due to ineffective compression
• Perforation
• Effective compression of the forearm can be achieved by using blood pressure calf

Crit Care 6(3): 199-204, 2002
Extensive Hematoma
Compartment syndrome

- Very rare, 0.1-0.4%
- Caused by perforation
- Five P’s
  - Pain
  - Paresthesia
  - Paralysis
  - Pallor
  - pulselessness

J Inter Cardiol 21(5):380-384,2008
Compartment syndrome
Single artery stenosis
Radial Artery Occlusion

• The incidence is up to 20%.

• Risk factors
  • large sheath size
  • occlusive hemostasis
  • lack of anticoagulation use.
Following POBA
Late occlusion of the radial artery
Late occlusion
Following orbital atherectomy and cutting balloon angioplasty
Radial Arteriovenous fistula

• Causes pain and swelling
• Palpable thrill, bruit
• Treatment
  • prolonged manual compression
  • Covered stent
  • Surgery

*Circulation. 2005;111:e99.*
Pseudoaneurysm

- Incidence 0.1%
- Pain and swelling at the site
- Diagnosis by color Doppler ultrasound
- Treatment
  - Ultrasound-guided compression
  - Thrombin injection
  - Surgery
LV perforation
LV perforation
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