Factors of affecting outcome of CLI procedures

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Epidemiology of patients with critical Limb Ischemia (CLI)

1-year outcome in Pt with CLI

Limb morbidity and mortality

- Alive with two limbs: 45%
- Amputation: 30%
- Mortality: 25%

More than half the patients with below-knee major amputation for ischemic disease had absolutely no symptoms of leg ischemia as recently as 6 months before.

Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II)
Prevalence of a prior history of intermittent claudication in CLI patients registered SPINACH study

In patients with a prior history of intermittent claudication, the majority had a duration of less than 5 years.

Prevalence of the absence of a prior history of IC in CLI patients classified according to clinical features

Risk factors
1) non-ambulatory status
2) diabetes mellitus
3) regular dialysis

Revascularization Selection for Patients with CLI

Bypass therapy (BSX)

Endovascular therapy (EVT)
Primary Endpoint: Amputation-free survival

AFS were 86±2%, 81±2%, 77±3%, and 74±3% at 3, 6, 9, and 12 months, respectively.

OLIVE: Endovascular Treatment of Infrainguinal Vessels: A Prospective Multi-center Registry in Japan

Secondary Endpoint: Time to wound healing

Factors predicting failure to achieve healing after 97 days

<table>
<thead>
<tr>
<th>Variables</th>
<th>HR (95%CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI &lt;18.5</td>
<td>0.54(0.31-0.96)</td>
<td>0.03</td>
</tr>
<tr>
<td>Hemodialysis</td>
<td>0.79(0.58-1.09)</td>
<td>0.15</td>
</tr>
<tr>
<td>Wound infection</td>
<td>0.60(0.36-0.98)</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Median time requiring complete wound healing was 97±10 days.

The proportion of not-healed patients was 54±3%, 29±3%, 18±3%, and 14±3% at 3, 6, 9, and 12 months, respectively.
CRITISCH registry assesses first-line treatment strategies for critical limb ischemia

Subjects: CLI patients lasting more than 2 weeks
Follow-Up: 2 years per subject
Study Design: Observational
Intervention: Surgical bypass (vein or prosthetic)
Endovascular (Angioplasty +/- stent)
Patchplasty/Hybrid treatment (Femoral artery patchplasty +/- profundoplasty +/- endovascular treatment)
Conservative treatment (no vascular intervention)

Primary Endpoint: **2-year amputation-free survival**
(defined as the time until an above-ankle amputation of the index limb or death, or both)

Overview of recruitment procedure (first-line treatment of choice)

CLI lasting > 2 weeks
Rutherford 4 - 6

n = 1,200 patients

- Group I Endo: 642 (53.4%)
- Group II Bypass: 284 (23.7%)
- Group III Patchplasty: 126 (10.5%)
- No intervention
  - Group IV Conservative: 118 (9.8%)
  - Group V Primary amputation: 30 (2.5%)

Decision for type of treatment by the responsible physician

## In-hospital end points

<table>
<thead>
<tr>
<th>End Point</th>
<th>Group I, Endo</th>
<th>Group II, Bypass</th>
<th>Group III, FAP</th>
<th>Group IV, Conservative</th>
<th>Group V, Amputation</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Composite end point</strong></td>
<td>24 (4)</td>
<td>17 (6)</td>
<td>8 (6)</td>
<td>9 (8)</td>
<td>-</td>
<td>0.172</td>
</tr>
<tr>
<td><strong>Amputation</strong></td>
<td><strong>20 (3)</strong></td>
<td><strong>10 (4)</strong></td>
<td>5 (4)</td>
<td>6 (5)</td>
<td>-</td>
<td>0.67</td>
</tr>
<tr>
<td><strong>Death</strong></td>
<td>6 (1)</td>
<td>8 (3)</td>
<td>4 (3)</td>
<td>4 (3)</td>
<td>3 (10)</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Hemodynamic failure</strong></td>
<td>81 (13)</td>
<td>24 (8)</td>
<td>11 (9)</td>
<td>107 (91)</td>
<td>-</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>MACCE</strong></td>
<td>23 (4)</td>
<td>15 (5)</td>
<td>8 (6)</td>
<td>6 (5)</td>
<td>4 (13)</td>
<td>0.097</td>
</tr>
<tr>
<td><strong>Reintervention</strong></td>
<td>50 (8)</td>
<td>33 (14)</td>
<td>11 (9)</td>
<td>6 (5)</td>
<td>1 (3)</td>
<td>0.015</td>
</tr>
<tr>
<td><strong>Type of reintervention</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endovascular</td>
<td>32 (64)</td>
<td>6 (9)</td>
<td>5 (45)</td>
<td>1 (17)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Open surgery</td>
<td>18 (36)</td>
<td>30 (91)</td>
<td>6 (55)</td>
<td>5 (83)</td>
<td>1 (100)</td>
<td></td>
</tr>
<tr>
<td>Minor amputation</td>
<td>80 (12)</td>
<td>39 (14)</td>
<td>7 (6)</td>
<td>5 (4)</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Risk factors of all in-hospital end points
- multivariate logistic regression models -

Composite endpoint: major amputation and/or death

Endpoint: amputation

Endpoint: mortality

Odds Ratios and 95% Confidence Intervals

Secondary Endpoint:
Time to wound healing

<table>
<thead>
<tr>
<th>Event</th>
<th>1 year</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVT after 1 year</td>
<td>18.7%</td>
<td>28.5%</td>
<td>37.0%</td>
</tr>
<tr>
<td>EVT after 2 years</td>
<td>7.6%</td>
<td>7.3%</td>
<td>5.6%</td>
</tr>
<tr>
<td>EVT after 3 years</td>
<td>14.7%</td>
<td>9.4%</td>
<td>7.8%</td>
</tr>
</tbody>
</table>

- Death
- Major amputation
- Survive with wounds
- Survive without wounds

OLIVE: 1-year and 3-year results

Primary Endpoint: Amputation-free survival

Follow-up period (months) 0 12

<table>
<thead>
<tr>
<th>No. at risk</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>312</td>
<td>100</td>
</tr>
<tr>
<td>204</td>
<td>73.6</td>
</tr>
</tbody>
</table>

Factors:
- BMI <18.5
- Heart failure
- Wound infection
- Rutherford 6
Risk factors for amputation-free survival (AFS) in patients with CLI

- **In short period**
  - Year
  - Heat failure
  - Wound infection
  - BMI <18.5

- **In long period**
  - Years
  - Age
  - Chronic Dialysis
  - Rutherford 6
  - BMI <18.5
Secondary Endpoint:
Wound recurrence and its predictors

<table>
<thead>
<tr>
<th>Stepwise analysis for recurrence of wound</th>
<th>OR</th>
<th>95%CI</th>
<th>Wald p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Gender</td>
<td>1.61</td>
<td>0.74 - 3.52</td>
<td>0.23</td>
</tr>
<tr>
<td>Serum albumin&lt;3.0g.dL</td>
<td>2.72</td>
<td>0.42 - 17.61</td>
<td>0.29</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1.75</td>
<td>0.76 - 4.01</td>
<td>0.19</td>
</tr>
<tr>
<td>Hemodialysis</td>
<td>1.52</td>
<td>0.74 - 3.14</td>
<td>0.26</td>
</tr>
<tr>
<td><strong>Isolated below-the knee lesions</strong></td>
<td><strong>4.54</strong></td>
<td><strong>2.20 - 9.37</strong></td>
<td><strong>&lt;.0001</strong></td>
</tr>
</tbody>
</table>

| STEPWISE                                 |      |             |              |
| Diabetes mellitus                        | 2.05 | 0.94 - 4.45 | 0.07         |
| **Isolated below-the knee lesions**      | **4.28** | **2.15 - 8.53** | **< 0.001** |

Recurrence of wound until 3 years: **43.9 %**

Take Home Messages

From SPINACH registry

✓ Prevalence of the absence of prior intermittent claudication in patient with critical limb ischemia was 50%.

From CRITISH registry

✓ Patients who received BSX had an elevated rate of in-hospital death compared with EVT.
✓ CAD and previous MI were identified as risk factors for AFS.

From OLIVE 3-year results

✓ Wound recurrence out to 3 years was 43.9%.
✓ CLI due to isolated BTK lesion was a wound recurrence predictor.
Factors of affecting outcome of CLI procedures

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