3-year results of the OLIVE registry:
A prospective multicenter study
in patients with critical limb ischemia

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Disclosure

Speaker name: Osamu Iida

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

I do not have any potential conflict of interest
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)
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

Number of 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.

<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>2.22 (1.23-4.01)</td>
<td>0.008</td>
</tr>
<tr>
<td>Statin administration</td>
<td>0.59 (0.30-1.13)</td>
<td>0.11</td>
</tr>
<tr>
<td>Anemia</td>
<td>1.80 (0.97-3.32)</td>
<td>0.06</td>
</tr>
<tr>
<td>Heat failure</td>
<td>1.73 (1.02-2.91)</td>
<td>0.04</td>
</tr>
<tr>
<td>Wound infection</td>
<td>1.39 (1.07-3.32)</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Secondary Endpoint:
Time to wound healing

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.

Factors predicting failure to achieve healing after 97 days

<table>
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<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>

registry assesses first-Line treatment strategies for CLI

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%)

Group IV
Conservative
118 (9.8%)

Group V
Primaryamputation
30 (2.5%)

Decision for type of treatment by the responsible physician
### In-hospital end points

<table>
<thead>
<tr>
<th></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>Composite end point</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>Amputation</td>
<td>20(3)</td>
<td>10(4)</td>
<td>5(4)</td>
<td>6(5)</td>
<td>-</td>
<td>0.67</td>
</tr>
<tr>
<td>Death</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>Hemodynamic failure</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>MACCE</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>Reintervention</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>Type of reintervention</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 endpoints - multivariate logistic regression models -

- Composite endpoint: major amputation and/or death
- Endpoint: amputation
- Endpoint: mortality

Secondary Endpoint: Time to wound healing

- **EVT after 1 year**:
  - Death: 18.7%
  - Major amputation: 7.6%
  - Survive with wounds: 14.7%
  - Survive without wounds: 58.9%

- **EVT after 2 years**:
  - Death: 28.5%
  - Major amputation: 7.3%
  - Survive with wounds: 9.4%
  - Survive without wounds: 54.8%

- **EVT after 3 years**:
  - Death: 37.0%
  - Major amputation: 7.8%
  - Survive with wounds: 5.6%
  - Survive without wounds: 49.6%

OLIVE: 1-year and 3-year results

Primary Endpoint: Amputation-free survival

<table>
<thead>
<tr>
<th>Follow-up period (months)</th>
<th>0</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. at risk</td>
<td>312</td>
<td>204</td>
</tr>
<tr>
<td>Rate (%)</td>
<td>100</td>
<td>73.6</td>
</tr>
</tbody>
</table>

Factors

- BMI < 18.5
- Heart failure
- Chronic Dialysis
- Rutherford 6
Risk factors for amputation-free survival (AFS) in patients with CLI

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

**In long period**
- 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><strong>ALL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Gender</td>
<td>1.61</td>
<td>0.74</td>
<td>3.52</td>
</tr>
<tr>
<td>Serum albumin&lt;3.0g.dL</td>
<td>2.72</td>
<td>0.42</td>
<td>17.61</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1.75</td>
<td>0.76</td>
<td>4.01</td>
</tr>
<tr>
<td>Hemodialysis</td>
<td>1.52</td>
<td>0.74</td>
<td>3.14</td>
</tr>
<tr>
<td><strong>Isolated below-the knee lesions</strong></td>
<td>4.54</td>
<td>2.20</td>
<td>9.37</td>
</tr>
<tr>
<td><strong>STEPWISE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>2.05</td>
<td>0.94</td>
<td>4.45</td>
</tr>
<tr>
<td><strong>Isolated below-the knee lesions</strong></td>
<td>4.28</td>
<td>2.15</td>
<td>8.53</td>
</tr>
</tbody>
</table>

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

Take Home Massages

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.
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