The use of a Colapinto TIPS Needle under cone-beam computed tomography guidance for true lumen re-entry in subintimal recanalization of chronic iliac artery occlusion.

Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan
Huei-Lung Liang, M.D.
Intraluminal PTA of chronically occluded CIA

Terumo

CTO wire
chronic occlusion of iliac artery

SIA with spontaneous Terumo wire reentry
Chronic occlusion of iliac artery
reentry devices

1. expensive – not reimbursed
2. calcified vascular wall
3. thickened mural thrombus

Pioneer Catheter
Medtronic

Outback
Cordis
Outback Catheter Reentry

2013-09

2015-11
reentry failed by Outback due to thickened mural thrombus
TIPS needle reentry guided by two orthogonal views
TIPS needle reentry guided by cone-beam CT
TIPS needle reentry guided by cone-beam CT
78/M, Leriche s/p PTA
intrapluminal PTA for right and subintimal for left

23% of our Leriche syndrome patients require SIA for successful recanalization
Conclusion

• The technique of subintimal angioplasty is essential to achieve a high technical success in managing chronic total iliac occlusion (including Leriche syndrome).

• The use of Colapinto TIPS needle, especially under cone-beam CT image guidance, appears to be safe and effective to re-enter the true lumen of abdominal aorta.
Thanks for your Attention
Leriche syndrome

- aortic occlusion < 3cm $\Rightarrow$ bil Ao-iliac stenting
- long segmental aortic occlusion:
  $\Rightarrow$ thrombolytic therapy first with brachial puncture as the initial approach
- 100% technical success with 5% reocclusion rate
- 23% of Leriche syndrome in our patients require SIA technique for successful recanalization
<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Age (y)/sex</th>
<th>Symptom</th>
<th>Side</th>
<th>Occlusion</th>
<th>Occlusion length</th>
<th>TASC</th>
<th>ABI</th>
<th>fu image</th>
<th>FU (mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>72/M</td>
<td>Claudication</td>
<td>Left</td>
<td>CIA/EIA</td>
<td>14 cm</td>
<td>D</td>
<td>0.52/0.86</td>
<td>x</td>
<td>3(^a)</td>
</tr>
<tr>
<td>2</td>
<td>58/F</td>
<td>Claudication</td>
<td>Right</td>
<td>CIA/EIA</td>
<td>14 cm</td>
<td>D</td>
<td>0.48/0.75</td>
<td>MR</td>
<td>45</td>
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<tr>
<td>3</td>
<td>86/M</td>
<td>Claudication</td>
<td>Left</td>
<td>CIA/EIA</td>
<td>15 cm</td>
<td>D</td>
<td>0.43/0.79</td>
<td>x</td>
<td>5(^b)</td>
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<tr>
<td>4</td>
<td>45/M</td>
<td>Limb coldness</td>
<td>Right</td>
<td>CIA</td>
<td>10 cm</td>
<td>B</td>
<td>s/p BK</td>
<td>x</td>
<td>36</td>
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<tr>
<td>5</td>
<td>85/M</td>
<td>Claudication</td>
<td>Left</td>
<td>CIA</td>
<td>4 cm</td>
<td>B</td>
<td>0.79/1.07</td>
<td>CT</td>
<td>16(^b)</td>
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<tr>
<td>6</td>
<td>87/M</td>
<td>Chronic ulcer</td>
<td>Right</td>
<td>CIA/EIA</td>
<td>15 cm</td>
<td>D</td>
<td>0.46/1.28</td>
<td>x</td>
<td>6(^a)</td>
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<tr>
<td>7</td>
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<td>Claud Claudication</td>
<td>Left</td>
<td>CIA</td>
<td>7 cm</td>
<td>B</td>
<td>0.29/0.81</td>
<td>CT</td>
<td>11</td>
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<tr>
<td>8</td>
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<td>Claudication</td>
<td>Right</td>
<td>CIA</td>
<td>5 cm</td>
<td>B</td>
<td>0.8/1.26</td>
<td>US</td>
<td>8</td>
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<tr>
<td>9</td>
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<td>CIA/EIA</td>
<td>13 cm</td>
<td>D</td>
<td>0.38/1.14</td>
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<td>6</td>
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<td>CIA</td>
<td>5 cm</td>
<td>B</td>
<td>0.41/x</td>
<td>x</td>
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</tbody>
</table>

ABI = ankle−brachial index before and after PTA; CIA = common iliac artery; CT = computed tomography; EIA = external iliac artery; F = female; FU = follow up; M = male; MR = magnetic resonance; s/p BK = post below knee amputation; TASC = Trans-Atlantic Inter-Society Consensus class; US = ultrasound; x = not done.

\(^a\) Lost to follow-up.

\(^b\) Patient died.
Outback Catheter

Pioneer Catheter

to entry devices
與世界水準相較
以reentry 導管治療髂動脈(iliac artery)慢性阻塞疾病

<table>
<thead>
<tr>
<th>國家</th>
<th>作者</th>
<th>發表雜誌</th>
<th>年份</th>
<th>針/導管</th>
<th>病人數目</th>
<th>成功率</th>
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<tr>
<td>美國</td>
<td>Sharafuddin</td>
<td>VEV Surg</td>
<td>2010</td>
<td>Rosch-U</td>
<td>11</td>
<td>88.8%</td>
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<td>加拿大</td>
<td>Gastaldo</td>
<td>JVIR</td>
<td>2012</td>
<td>MTSN</td>
<td>15</td>
<td>91%</td>
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<tr>
<td>加拿大</td>
<td>Smyth</td>
<td>JVIR</td>
<td>2013</td>
<td>5F canula</td>
<td>12</td>
<td>91%</td>
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<td>美國</td>
<td>Etezadi</td>
<td>JVIR</td>
<td>2010</td>
<td>Outback</td>
<td>11</td>
<td>91%</td>
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<td>美國</td>
<td>Jacobs</td>
<td>JVS</td>
<td>2006</td>
<td>Pioneer</td>
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<td>高雄榮總</td>
<td>Liang</td>
<td>JCMA</td>
<td>2014</td>
<td>Colapinto</td>
<td>10</td>
<td>100%</td>
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</tbody>
</table>
與世界水準相較

Leriche’s Syndrome 血管內治療成效

<table>
<thead>
<tr>
<th>國家</th>
<th>作者</th>
<th>義大利 Lagana</th>
<th>美國 Moise</th>
<th>韓國 Kim</th>
<th>德國 Krankenburg</th>
<th>中國 Liang</th>
<th>高雄榮總 Liang HL.</th>
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</thead>
<tbody>
<tr>
<td>發表雜誌</td>
<td></td>
<td>Rad Med</td>
<td>J EVT</td>
<td>JVS</td>
<td>J CV Surg</td>
<td>網路公布</td>
<td>準備投稿中</td>
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<tr>
<td>技術成功率</td>
<td>87.5%</td>
<td>93%</td>
<td>81.6%</td>
<td>92.5%</td>
<td>76%</td>
<td>100%</td>
<td></td>
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<tr>
<td>病人數目</td>
<td>8</td>
<td>31</td>
<td>?*</td>
<td>21</td>
<td>25</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>一年暢通率</td>
<td>88.8%</td>
<td>85%</td>
<td>88.4%</td>
<td>NR</td>
<td>NR</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

NR: not reported

*: 韓國Kim的series包含了單純腹主動脈阻塞和複雜的腹主動脈加上兩邊髂動脈阻塞的病人，因此他們所治療的真正Leriche’s syndrome的病人數無法得知。
Use of a Colapinto TIPS Needle for aortic re-entry in subintimal recanalization of chronic iliac artery occlusion.

高雄榮總放射線部
梁慧隆醫師
Intraluminal PTA with CTO wire
Intraluminal PTA with CTO wire

balloon-aid SIR for left occlusion

2015-07
Intraluminal PTA with CTO wire
The technical failure was seen in 20% to 30% of cases, Pioneer catheter (Medtronic, Dublin, Ireland), Outback device (Cordis, Johnson & Johnson, Miami Lakes, Florida, USA), and Frontrunner catheter (Cordis), had been developed with successful re-entry at 90% to 100%. However, availability, cost, and the lack of user experience limit their implementation.

CTO wire (Victory, Boston Scientific, Marlborough, MA, USA) was initially attempted for all occlusions. If we failed to cross the occlusion, subintimal angioplasty was attempted.
63/M, Leriche s/p PTA
SIA for right iliac artery

2013-09  2013-11  2017-02

5x19mm
reentry devices
reentry techniques

- hard end of the wire
- re-fashion catheter tip (sharp edge)
- kissing ballooning technique
- reentry devices
- trans-septal/TIPS needle
Thrombolysis by balloon tamponade

3x200mm balloon
Leriche syndrome
Occlusion of the distal abdominal aorta and bilateral iliac arteries

- first described in 1923 by Rene Leriche
- female preponderance
- symptoms: buttock and thigh claudication, diminished peripheral pulse, erectile dysfunction
- diffuse atherosclerotic changes, trauma, vasculitis

- aortobifemoral bypass grafting: standard of surgical care:
  - 5-10 year patency rates: 79-85%.
  - mortality rate: 3.3-4.6%; morbidity: 8.3-13.1%.
Leriche syndrome

endovascular therapy

- most challenging and complex lesions for endovascular Tx.
- Technical success: 76-93%
- Moise: T.S.: 93%, aortic stent: 55%
  primary patency at 1 & 3-years, 85 & 66%
- Kim: T.S. : 81.6%, aortic stents: 92.5%
  primary patency at 1 & 3-years: 88.4 & 80.1%
38/M, Leriche s/p bil PTA with SIA for right

Intermittent abdominal pain in the first 3 months

2017-03 SMA compromised
38/M, Leriche s/p bil SIA

2017-10
58/M, Leriche s/p bil intraluminal PTA

2013-01

2014-07
35/F, Leriche & left PopA occlusion s/p PTA with SIA for right IA
82/F, AF with acute occlusion of left EIA and run-off vessels
Termination by clinician’s request

No amputation
87/F, occlusion of left iliac, SFA, popA & runoff

balloon dilation + stent + thrombolysis
post treatment
TIPS needle reentry
The use of a Colapinto TIPS Needle under cone-beam computed tomography guidance for true lumen re-entry in subintimal recanalization of chronic iliac artery occlusion.

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