Exploring DCB in TAO

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Disclosure

Speaker name: Mingjin Guo

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
Thromboangiitis Obliterans (Buerger’s disease) is a nonatherosclerotic segmental inflammatory disease that most commonly affects the small and medium-sized arteries, veins, and nerves of the arms and legs.

TAO usually is manifested with distal extremity ischemia in a smoker before the age of 45 to 50 years. The median age at diagnosis is 34 years. Characteristically, distal extremity ischemia involves the feet, legs, hands, or arms.

**Table 79-1** Pooled Characteristics of Patients with Thromboangiitis Obliterans from Different Regions Globally

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Uncommon</th>
<th>Declining</th>
<th>Small and medium</th>
<th>29-42</th>
<th>42.5 ± 8.4</th>
<th>77-98</th>
<th>2-23</th>
<th>93-94</th>
<th>17-62</th>
<th>46-89</th>
<th>38-85</th>
<th>2-21</th>
<th>35-93</th>
<th>16-20</th>
<th>40-62</th>
<th>Unusual</th>
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<td>Prevalence</td>
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<td>Incidence</td>
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<td>Involved arterial size</td>
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<td>Age at diagnosis (years)</td>
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<td>Age at hospital admission (years)</td>
<td>42.5 ± 8.4</td>
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<td>Male, %</td>
<td>77-98</td>
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<td>Female, %</td>
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<td>History of smoking, %</td>
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<td>Intermittent claudication, %</td>
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<td>Rest pain, %</td>
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<td>Ischemic ulcers and gangrene, %</td>
<td>38-85</td>
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<td>Upper extremity</td>
<td>2-21</td>
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<td>Lower extremity</td>
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<td>Both</td>
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<td>Migratory superficial phlebitis, %</td>
<td>40-62</td>
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<td>Deep venous thrombosis</td>
<td>Unusual</td>
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<td>Raynaud’s phenomenon, %</td>
<td>10-45</td>
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<td>Sensory findings, %</td>
<td>69</td>
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<td>Abnormal Allen’s test result, %</td>
<td>63</td>
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<td>Joint manifestations, %</td>
<td>12.5</td>
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**Thromboangiitis obliterans or Buerger’s disease: challenges for the rheumatologist.** Rheumatology (Oxford) 46:192-199, 2007
Treatment

Medications
- Prostaglandin Analogues
- Guanethidine
- Growth Factors

Revascularization
- Endovascular Bypass

Smoking cessation

the first and most important, but insufficient in patients with CLI
Endovascular management of Buerger’s disease is feasible, safe, and effective with high rate of limb salvage and clinical improvement.

Table 2. Clinical outcomes of patients.

<table>
<thead>
<tr>
<th></th>
<th>Pre-intervention</th>
<th>1st month</th>
<th>3rd month</th>
<th>6th month</th>
<th>1 year</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Rutherford classification</td>
<td>4.81±0.50</td>
<td>3.51±0.73</td>
<td>3.40±0.79</td>
<td>3.36±0.78</td>
<td>3.27±0.76</td>
<td>&lt;0.001</td>
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<tr>
<td>Ankle brachial index</td>
<td>0.40±0.12</td>
<td>0.91±0.23</td>
<td>0.88±0.23</td>
<td>0.85±0.20</td>
<td>0.84±0.19</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Triphasic blood flow, n_{observed}/n_{cases} (%)</td>
<td>0 (0)</td>
<td>20/22 (91)</td>
<td>20/22 (91)</td>
<td>20/22 (91)</td>
<td>20/22 (91)</td>
<td>&lt;0.001</td>
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<tr>
<td>Ulcer, n_{observed}/n_{cases} (%)</td>
<td>7/22 (31.9)</td>
<td>2/22 (9.1)</td>
<td>2/22 (9.1)</td>
<td>2/22 (9.1)</td>
<td>2/22 (9.1)</td>
<td>&lt;0.001</td>
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<tr>
<td>Rest pain, n_{observed}/n_{cases} (%)</td>
<td>10/16 (62.5)</td>
<td>5/16 (31.3)</td>
<td>5/16 (31.3)</td>
<td>5/16 (31.3)</td>
<td>5/16 (31.3)</td>
<td>&lt;0.001</td>
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<tr>
<td>Smoking, n_{observed}/n_{cases} (%)</td>
<td>15/16 (93.8)</td>
<td>6/16 (37.5)</td>
<td>6/16 (37.5)</td>
<td>6/16 (37.5)</td>
<td>6/16 (37.5)</td>
<td>&lt;0.001</td>
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</tbody>
</table>

Milestone of endovascular intervention: DCBs significantly improved vascular patency of arteriosclerotic stenosis/occlusion.
In fact, endovascular treatment in case of TAO may be technically challenging because of the prevalent location of below the knee lesions. The treatment of below the knee lesions with DCB in atherosclerotic disease has made great progress in past several years.

<table>
<thead>
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<th>DCB (N=48)</th>
<th>PTA (N=46)</th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td>Primary Patency</td>
<td>78.7% (37/48)</td>
<td>28.3% (13/46)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Occlusion</td>
<td>8</td>
<td>27</td>
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<tr>
<td>TLR</td>
<td>3</td>
<td>12</td>
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<tr>
<td>Amputation</td>
<td>1</td>
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</tbody>
</table>

Global BTK Study

Freedom from TLR

Michael Lichtenberg, MD, Oral presentation at LINC 2019

Wei Guo, MD, Oral presentation at LINC 2019
DCBs: Paclitaxel-based drug coating:
• block early cell proliferative factors,
• inhibit cytoskeleton formation,
• block mitosis,
• effectively inhibit cell proliferation,
• inhibit smooth muscle cell migration,
• phenotypic changes
• inhibit intimal hyperplasia

Could DCBs improve vascular patency rate of stenosis/occlusion caused by TAO?

Reference:
There are fewer reports of endovascular treatment of Burger’s disease with DCB, and we attempt to explore the safety and efficiency of DCB in Burger’s disease.
case 1

M, 34y.

Chief complaint: gangrene toes of left foot for 2 months.

History of smoking for 10 years

Diagnosis: Buerger’s disease
Dorsalis pedis

Peroneal artery

Posterial tibial artery
DCB for posterial tibal artery

Post-operation

Post-operation

3 months follow up, Ulcer healed, No pain
case 2

M, 42y.

Chief complaint: intermittent claudication in left lower extremity for 2 years

History of smoking for 17 years

Diagnosis: Buerger’s disease
Pre-operation

Pre-operation DCB for posteriortibial artery
Anterior tibial artery
Dorsal artery
Post-operation

5 months follow up, No IC
M, 42y.

Chief complaint: gangrene toes of right foot for 6 months

History of smoking for 6 years

Diagnosis: Buerger’s disease
6 months follow up, Ulcer not healed, rest pain relieved
case 4

M, 39y.

Chief complaint: rest pain in left foot for 2 weeks

History of smoking for 11 years

Diagnosis: Buerger’s disease
Pre-operation

Pre-operation

Peroneal artery
7 months follow up, No rest pain, IC improved
1. DCB in TAO is safe and effective, while the long-term outcome needs more evidences
2. DCB in TAO might be more effective because of its ability of inhibiting intimal hyperplasia compared with POBA
3. Vascular preparation and outflow are the key points
THANKS!!