We want to know where we are when we treat CTO’s:

OCT guided revascularization

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Disclosure

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I have the following potential conflicts of interest to report:

- Consulting, Speaking honoraria
  - BARD, Medtronic, Spectranetics, Biotronik, Bayer Healthcare, Daiichi Sankyo, Intact Vascular, Profusa, Rexgenero,
OCT guided revascularization
Does it count?

Dear Doctor,
I’m 65 yr´s old, and suffer from IC and MRA has shown a 25 cm long occlusion of my femoral artery. I was sent to a vascular surgeon, but they are refusing to treat me!! I want to be back in my daily business, I have 3 grandchildren, I want to spend my time with, hiking, swimming, running...
Please can you help me???

Dear Buddy, no worry!
I´m blind, but I´m the best physician you can get!
and you can trust me that you will feel it when I cross the occlusion of your leg! You just have to guide me!
Whenever there is pain, just shout than I will find back the way into your femoral artery!
Debulking atherosclerotic tissue and sealing the spot with immunosuppressive /antiinflammatory drugs brings treatment of atherosclerotic disease on the level of cancer treatment (“Remove the bad tissue”)

Different ways how to do it (directional, rotational....)

Limitations to current systems
- Complication rate (perforation, distal embolisation, dissections..)
- No visualization how deep we cut
- If we go to deep (media and adventitia) higher rate of restenosis
- We do not know if we start high enough and go down far enough (guided only from outside by radiation)
- Long lasting procedures, higher rates of radiation exposure
Histopathological Evidence of Adventitial or Medial Injury Is a Strong Predictor of Restenosis During Directional Atherectomy for Peripheral Artery Disease


- There were no significant differences in lesion length (58.7±12.8 vs 56.2±13.6 mm, p=0.40), vessel runoff (1.9±0.6 vs 2.0±0.6, p=0.37), or reference vessel diameter between patients with and without adventitial or medial injury, respectively.

- The 1-year restenosis rate was significantly higher (p<0.0001) in patients with adventitial or medial injury (97%, 60/62) as compared with those without (11%, 6/54).
OCT- guided Atherectomy

Advantages

2 dimensional understanding of disease location

3rd dimension shows eccentric plaque, varying in morphology and density
OCT- guided Atherectomy

Advantages

What happens when we treat without regard to disease eccentricity?

Orbital Atherectomy*
Laser Atherectomy*
Angioplasty*

*OCT images completed via Dragonfly (St. Jude) immediately following therapy
OCT-guided Atherectomy

Advantages

WHAT ARE WE REALLY DEBULKING WITH DIRECTIONAL AHERECTOMY?

Turbohawk atherectomy / deep wall components

Vaso vasorum
OCT- guided Atherectomy

Advantages

WHAT ARE WE REALLY DEBULKING WITH OCT GUIDED AHERECTOMY?

Small media resection in yellow – NO ADVENTITIA
OCT-guided Atherectomy

Advantages

- Less radiation exposure

Total Fluoroscopy Time (mins)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Time (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVUS Assisted</td>
<td>44.6</td>
</tr>
<tr>
<td>Viance CTO</td>
<td>39.1</td>
</tr>
<tr>
<td>Excimer Laser</td>
<td>31.1</td>
</tr>
<tr>
<td>Frontrunner CTO (CTO crossing only time)</td>
<td>22.9</td>
</tr>
<tr>
<td>DEFINITIVE Ca+</td>
<td>21.2</td>
</tr>
<tr>
<td>Pantheris Case Series</td>
<td>14.7</td>
</tr>
<tr>
<td>Pantheris +/- Ocelot</td>
<td>5.3*</td>
</tr>
</tbody>
</table>

*Atherectomy time only

References:
OCT-guided Atherectomy

Advantages

We treat the atherosclerotic burden more efficiently

Lesions treated by OCT Guided Atherectomy, are longer as rated by fluoroscopy
OCT-guided Atherectomy

Advantages

Treating ESRD with zero contrast and low fluoroscopy

Pre-Proximal SFA CTO
Pre-Distal SFA CTO
Post Ocelot CTO Crossing
Post Pantheris
OCT-guided Atherectomy

- Advantages

Treating ISR: Know where the struts are!
OCT- guided Atherectomy

Advantages

Treating ISR: Know where the struts are!
OCT-guided Atherectomy

Advantages

Identifying different kinds of calcium

14 cm SFA CT0  Post Pantheris  Post DCB
OCT-guided Atherectomy

Evidence
OCT- guided Atherectomy

Evidence
- Case series of 28 patients

TOTAL COHORT
- Patients treated n=28 (30 lesions)
- Treated dates July – December 2015
- Average lesion length 10.3 cm (2-30cm)

CTO COHORT
- Patients/lesions treated n=12/13 (43% total patient cohort)
- OCT guided CTO crossing (Ocelot) standalone success (n=12/13 true lumen): 92.3%
CASE SERIES: LESION BREAKDOWN
N=28 PATIENTS; 30 LESIONS

LUMINAL GAIN FOLLOWING THERAPY

- Pantheris Standalone Luminal Gain: 77%
- Pantheris +/- Adjunctive Luminal Gain: 95%
- Adjunctive PTA (n=0 lesions): 0%
- Adjunctive DCB (n=24 lesions): 80%
- Adjunctive Stent* (n=5 lesions): 20%

*Average stent length 60mm
CASE SERIES: LESION BREAKDOWN
N=28 PATIENTS; 30 LESIONS

6 MONTH OUTCOMES
DUPLEX PSVR, ABI, TLR
Along with ABI Improvement

- Freedom From TLR @ 6 months: 93% (Total Cohort), 92% (CTO Cohort)
- Primary Patency @ 6 months (PSVR>2.4): 87% (Total Cohort), 92% (CTO Cohort)
Conclusions

- Learning curve for both Ocelot and Pantheris catheters (3-5 cases)
- Histologic analysis confirms “true lumen” CTO crossing followed by “true lumen” directional atherectomy
- Pantheris effectively debulks mild and moderate calcium
- OCT guided atherectomy may reduce need for adjunctive angioplasty and/or stenting
- Pantheris provides visual confirmation of exposed arterial layer for drug delivery
- Potential to dramatically reduce radiation and contrast exposure during revascularization (including CTOs)
- Limited results with ongoing follow-up to confirm outcomes benefit