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The predictors of <0.1 ABI change after all femoropopliteal balloon angioplasty

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Disclosures

Speaker name: Takuya Haraguchi

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



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Background

- **Vessel preparation before using DCB or Stent should be done to keep the patency.**
- **Long balloon and long inflation time with conventional balloon reduce severe dissection resulting in bailout stent.**
- **Even though we can obtain satisfied angiography after only balloon angioplasty, we sometimes encounter inadequate result which ABI do not improve in acute phase.**

Horie. JEVT2018;25(6):683-691

Tan. JEVT2018;25(2):192-200



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ABI 0.52 → 0.57 reocclusion

rt.SFACTO

6.0mm
Balloon

7.0mm
DCB

Next day

rt.SFA TASC2D CTO was treated with 6.0mm conventional long balloon and 7.0mm DCB. We could obtain this result whose residual stenosis was less than 50%. However, ABI did not improve and angiography showed the reocclusion next day.



What is the predictors of <0.1 ABI change after BA?

Objective:

We investigated

the predictors of inadequate result (<0.1 ABI^{*})

after all balloon angioplasty

without bailout stent

for femoropopliteal lesions.

* It means the patency does not keep after intervention. (Sensitivity 79%, Specificity 92%)

Decrinis M. Clin Investig. 1994;72(8):592-7



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Retrospective observational study in Single center

1st. June – 31st. Aug, 2018

EVT n=118



**FP revascularization (n=63)
with only balloon angioplasty
without bailout stent**



1 day later



**<0.1 ABI change
n=10**

Δ ABI 0.06 ± 0.04
($0.73 \pm 0.19 \rightarrow 0.78 \pm 0.18$)

**≥ 0.1 ABI change
n=53**

Δ ABI 0.38 ± 0.23
($0.54 \pm 0.30 \rightarrow 0.93 \pm 0.17$)



LINC Clinical Characteristics

Subject characteristics	< 0.1 ABI	≥0.1 ABI	p-value
Age, Y ± SD	74.0 ± 7.0	77.8 ± 9.9	0.159
Male Gender (%)	60% (6/10)	58.5% (31/53)	0.933
BMI, ± SD	23.3 ± 3.5	23.0 ± 4.9	0.853
ADL walking (%)	90% (9/16)	73.6% (39/53)	0.179
Amputation (%)	0% (0/10)	1.9% (1/53)	0.322
Diabetes Mellitus (%)	70% (7/10)	56.6% (30/53)	0.438
Current Smoker(%)	50% (5/10)	32.1% (17/53)	0.336
Coronary Artery Disease (%)	50% (5/10)	52.8% (28/53)	0.878
Ejection Fraction, % ± SD	59.7 ± 13.8	60.7 ± 13.8	0.829
Hemodialysis (%)	20% (2/10)	20.7% (11/53)	0.660
Rutherford Class, ± SD	3.0+/-0.9	3.3+/-1.1	0.331
Critical Limb Ischemia (%)	20% (2/10)	26.4% (14/53)	0.669



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Lesion Characteristics

Subject characteristics	< 0.1 ABI	≥0.1 ABI	p-value
De novo (%)	70% (7/10)	81.1% (43/53)	0.506
Diameter Stenosis, % ± SD	90.4 ± 11.3	96.0 ± 7.1	0.165
Lesion Length, cm ± SD	173.0 ± 91.0	170.7 ± 83.7	0.943
Focal lesion (%)	60% (6/10)	71.7% (38/53)	0.516
Diffuse lesion (%)	30% (3/10)	18.9% (10/53)	0.506
Total Occlusion (%)	40% (4/10)	47.2% (25/53)	0.693
Reference Vessel Diameter (mm)	5.26 ± 1.29	5.07 ± 0.99	0.673
Severe Calcification (%)	30% (3/10)	15.1% (8/53)	0.373
Thrombus (%)	50% (5/10)	9.4% (8/53)	0.040
BKA run-off, ± SD	2.1 ± 0.9	1.9 ± 0.8	0.458



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Treatment Characteristics

Subject characteristics	< 0.1 ABI	≥0.1 ABI	p-value
Residual Stenosis (%)	37.5 ± 13.2	25.0 ± 9.8	0.016
Acute Gain (%)	52.9 ± 3.2	71.0 ± 12.5	0.002
Semi/Non-Compliant Balloon (%)	80% (8/10)	86.8% (46/53)	0.640
Scoring/Cutting Balloon (%)	40% (4/10)	35.8% (19/53)	0.818
Size (mm)	5.5 ± 0.85	5.13 ± 0.73	0.224
Length (mm)	178.0 ± 83.9	183.4 ± 79.0	0.854
Pressure (atm)	14.3 ± 2.1	14.8 ± 4.5	0.592
Dilatation time (sec)	145.5 ± 85.4	123.4 ± 63.6	0.453
Drug Coating Balloon (%)	30% (3/10)	37.7% (20/53)	0.651
Size (mm)	6.0 ± 0.0	5.85 ± 0.49	0.186
Length (mm)	150.0 ± 0.0	139.0 ± 25.5	0.069
Pressure (atm)	9.3 ± 2.3	8.9 ± 2.7	0.810
Dilatation time (sec)	180.0 ± 0.0	181.5 ± 6.7	0.330
IVUS usage (%)	20% (2/10)	18.9% (10/53)	0.939
Dissection (%)	60% (6/10)	71.7% (38/53)	0.516
NHLBI Class D-F (%)	20% (2/10)	18.9% (10/53)	0.937



The Predictors of <0.1 ABI change

	uni OR	CI	p-value	multi OR	CI	p-value
Diabetes Mellitus	1.79	0.42-7.68	0.434			
Hemodialysis	0.95	0.18-5.15	0.957			
Critical Limb Ischemia	0.70	0.13-3.68	0.670			
De novo	0.54	0.12-2.47	0.430			
Lesion Length >150mm	0.98	0.25-3.91	0.982			
Total Occlusion	0.75	0.19-2.95	0.677			
Reference Vessel <5mm	1.41	0.36-5.46	0.620			
Severe Calcification	2.41	0.51-11.3	0.265			
Thrombus	9.6	2.05-45.0	0.004	7.3	1.1-50.1	0.043
BKA poor run-off	0.77	0.18-3.32	0.719			
Residual Stenosis ≥50%	12.2	2.46-61.0	0.002	0.86	0.07-10.1	0.906
Acute gain ≤50%	13.1	2.8-61.7	0.001	11.5	1.3-102.4	0.029
Drug Coating Balloon	0.71	0.16-3.05	0.642			
IVUS usage	1.08	0.20-5.86	0.934			
Severe Dissection	1.08	0.20-5.86	0.934			



LINC The Predictors of <0.1 ABI change are

Thrombus (OR7.3) often results in acute occlusion.

Acute Gain $\leq 50\%$ (OR11.5) means plaque volume is too much to expand satisfactorily. Or, those plaques may be solid like dense fibrous tissue, not calcification.

Multiple linear regression

◆ The incidence of <0.1 ABI change

$$= 32\% \times (\text{Thrombus}) + 36\% \times (\text{Acute Gain} \leq 50\%)$$



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Thrombus (OR7.3) often results in acute occlusion.

Acute Gain $\leq 50\%$ (OR11.5) means plaque volume is too much to expand satisfactorily. Or, those plaques may be solid like dense fibrous tissue, not calcification.

- ✓ Severe Dissection is not the predictor of clinical failure. Dissection has a possibility to secure blood flow in acute phase more than recoil which has the above factors.



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Conclusion

In treatment of femoropopliteal lesion,
we highly recommend to

deploy the Scaffold

for

Thrombus and/or

Acute Gain \leq 50% after balloon angioplasty

to improve ABI leading to the patency.



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