Open Bypass Improves Perfusion More Than Endovascular Treatments: The Angiosome Concept Usually Does Not Matter: When Does It

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Is there a difference in perfusion change between EVT and Open Bypass?

A prospective trial

In Helsinki we measured Foot perfusion using ICG-FI before and after revascularization

Disclosures

- PI (Finland) in Voyager-trial (Bayer)
- PI (Finland) in InfoRAAA trial (Faron)
- Consultant for Sanofi

Improvement in the time-intensity curve. Maximum intensity increased from 112 to 246

Maximum intensity (AU) and time (s)

59 IU

30 IU

P<0.001
Evaluation of ALL FOOT ANGIOSES with ICG-FI before and after infrapopliteal endovascular and surgical revascularization

ICG-FI changes were analyzed in three groups:

1. Angiosomes that were revascularized DIRECTLY (targeted)
2. Angiosomes that were revascularized THROUGH GOOD COLLATERALS (indirectly targeted)
3. Angiosomes that were NOT REVASCULARIZED DIRECTLY NOR THROUGH STRONG COLLATERALS (nontargeted)

74 PATIENTS, 288 ANGIOSES, 46 EVT, 24 BYPASS

DIRECTLY REVASCULARIZED

Angiosomes that were REVASCULARIZED THROUGH COLLATERALS = indirectly revascularized

NOT DIRECTLY REVASCULARIZED, NO COLLATERALS = non targeted angiosomes

We have different feet with CLTI
How we know what is enough to achieve wound healing?
Wound healed in 56 (75.7%) patients

P=0.02

P=0.16

Increase in perfusion in the angiosome where the wound existed

13 au

46 au

Increase of perfusion in the angiosomes where the wound did not heal during the fu

Was only 13 units compared to 46 units in the angiosomes where the wound healed.

NOT DIRECTLY REVASCULARIZED, NO COLLATERALS

=non targeted angiosomes

Bypass: increase 44 au

Pta: increase 15 au

In the angiosomes that were not directly revascularized and there were poor collaterals, the increase in perfusion after pta 15 units

19 AU increase predicted overall wound healing

30 AU increase predicted wound healing in 6 months

35 AU increase predicted wound healing in 4 months

AUC 0.68-0.79

• Change in maximum intensity

OUTCOME of 74 PATIENTS

Mean FU 16.3+4.8 month (median 16.8, IQR 15-19 mo)

9 (12.2%) patients had amputation
In the angiosomes that were not directly revascularized and there were poor collaterals, the increase in perfusion after pta 15 units

Proportion of the patients that achieved increase over 19 IU in maximum intensity was significantly less in patients who underwent non-targeted revascularization. In bypass group it was 50% compared to 70-90% in the 2 other groups.

Bypass: increase 44 au
Pta: increase 15 au

Inflow

Outflow

Proportion of the patients that achieved increase over 19 IU in maximum intensity was significantly less in patients who underwent non-targeted revascularization. In bypass group it was 50% compared to 70-90% in the 2 other groups.

What are the factors associated with poor leg salvage after revascularization

- Diabetes
- ESRD
- Large wound/Rutherford classification
- Dementia
- Infection
- Poor patency
- Insufficient revascularization
- Delay

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35 IU increase, which predicted wound healing in 4 months, was seen only in 7% of the patients who underwent non-targeted EVT compared 40% in the 2 other groups. After non-targeted bypass, this was 38% compared to 60-70% in the 2 other groups.

**CONCLUSION I:** Open bypass increase perfusion more than endovascular treatments. If there is insufficient collaterals, targeted bypass leads to quicker wound healing than non-targeted bypass.

**CONCLUSION II:** Nontargeted endovascular revascularization is not recommended unless there are clear collaterals to the wound angiosome from the treated artery. Do not wait for a miracle! Do BYPASS or a new endovascular revascularization. Always, be aware of DELAY!