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Healing time of ischaemic lesions following  
infrainguinal revascularization.

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# Disclosures:

I have no conflict of interests



- Non healing wounds in patients with critical limb ischaemia, despite successful revascularization, are a source of on going concern.



- Complete healing is an outcome that is very seldom reported in studies of revascularisation for critical limb ischaemia (CLI)
- In a computerised literature research (1985-2005) 1914 papers on revascularisation for CLI were identified. Complete ulcer healing was reported in 17 studies (0.9%)

Hoffmann et al; Eur J Vasc Endovasc Surg 2007





# Predictors of wound healing time

- Local wound factors (Dryness, local infection, local trauma)
- Wound depth
- Patient's comorbidities (Diabetes, obesity, malnutrition)
- Medications that may impact on wound proliferation (NSAIDs, steroids, chemotherapeutic agents)
- Lifestyle factors (smoking, alcohol abuse)
- direct vs indirect revascularization



- 148 patients (150 limbs) with critical limb ischaemia and tissue loss (Fontaine IV) were followed up prospectively for one year after infrainguinal bypass.
- Multivariate Cox regression analysis provided risk ratios of clinically relevant factors for non healing tissue lesions.

Soedestroem et al; Eur J Vasc Endovasc Surg 2008



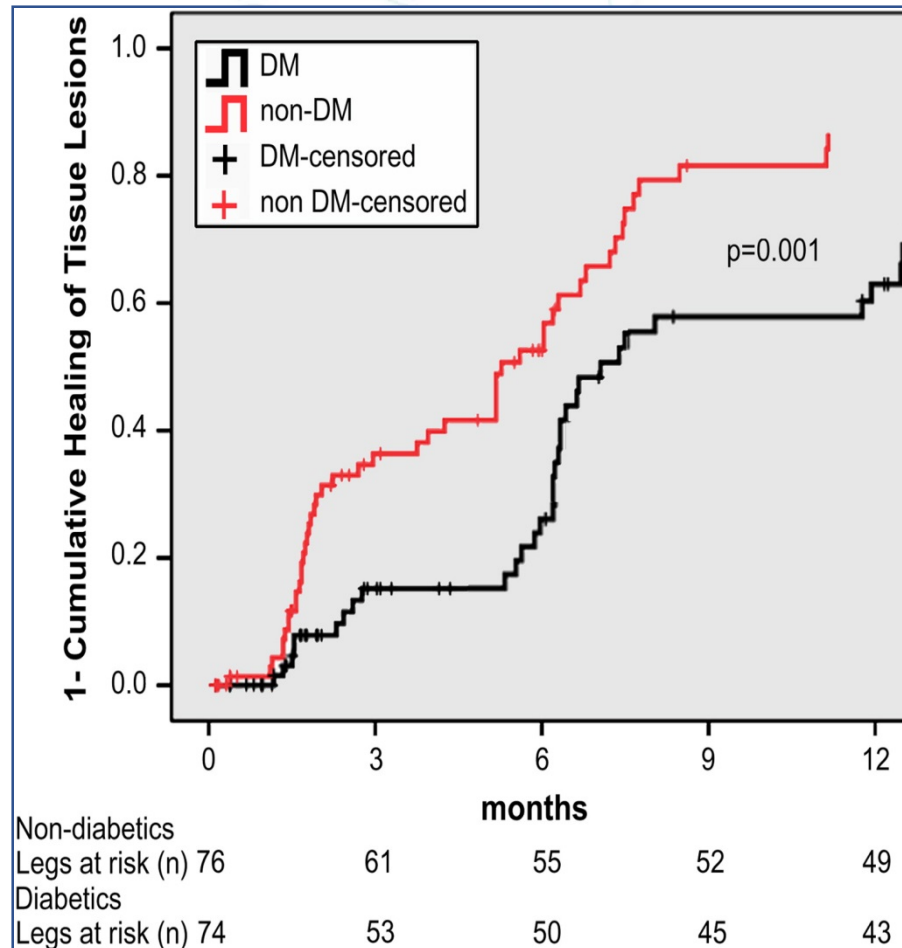
# Results

- Less than half of the patients achieved complete tissue healing within a period of 6 months postoperatively and at 12 months the overall healing rate was not more than 75%.
- Diabetes was the dominant risk factor for prolonged tissue healing time (log rank test,  $p=0.001$ )

Soedestroem et al; Eur J Vasc Endovasc Surg 2008







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- 58 consecutive critical limb ischaemia (CLI) limbs of 54 diabetic patients presenting with tissue loss underwent isolated popliteodistal vein bypass.
- Bypasses were classified into direct and indirect groups based on the angiosome concept, whether feeding artery flow to the site of ischaemic ulcers was achieved or not.

Lejay et al; Ann Vasc Surg 2014

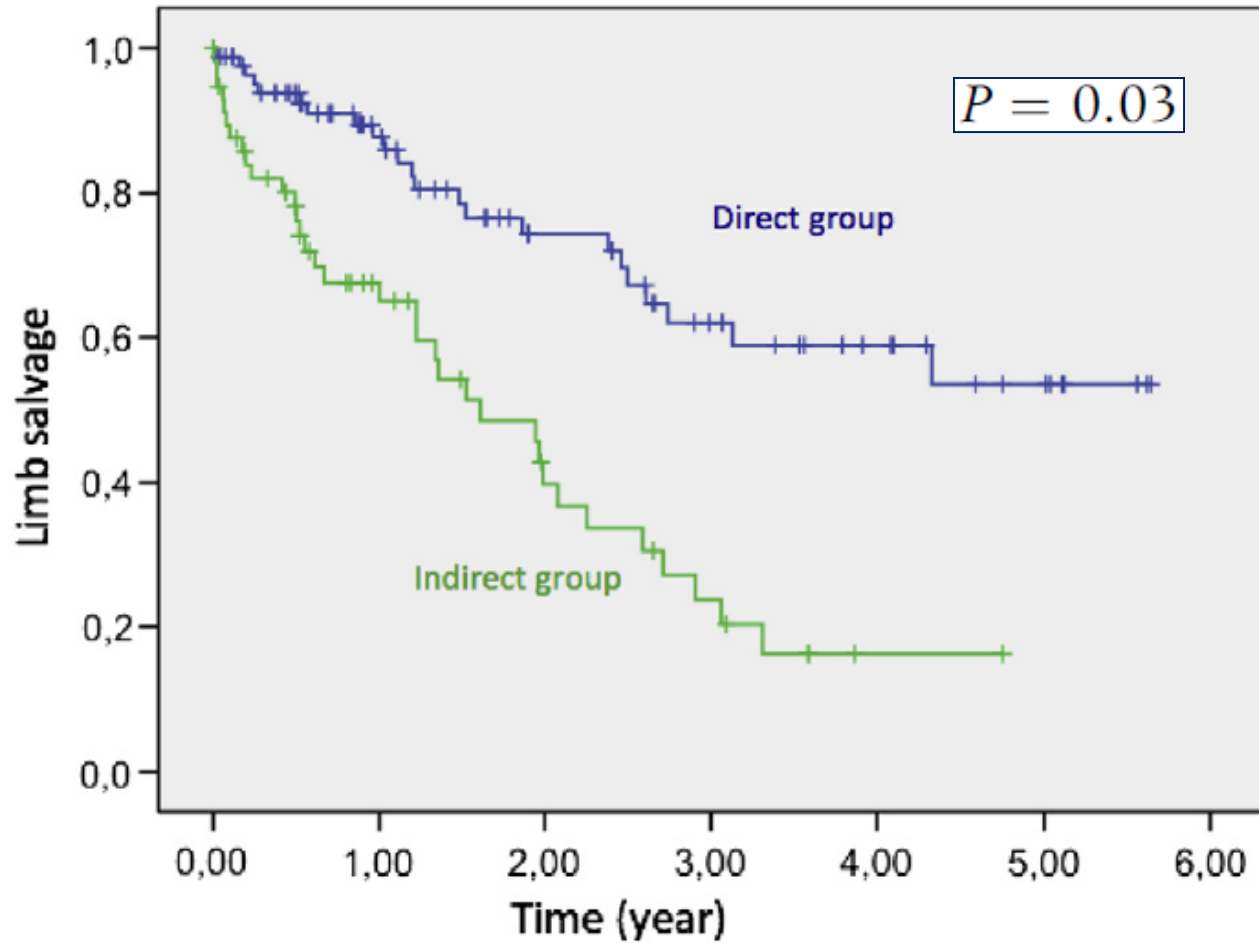


# Results

- Median ulcer healing time was  $56 \pm 18$  days in the direct group (n=36) and  $112 \pm 45$  days in the indirect group (n=22,  $p=0.01$ ).
- There was no difference between the groups in terms of survival or primary patency.
- Limb salvage rate was significantly higher in the direct group than in indirect group.

Lejay et al; Ann Vasc Surg 2014





Number at risk	1 year	2 years	3 years	4 years	5 years
<b>Direct group</b>	19	18	15	9	6
<b>Indirect group</b>	13	6	4	3	-



- In a prospective observational study 212 patients with CLI underwent successful infrapopliteal angioplasty to assist wound healing and limb salvage from June 2014-March 2016.
- Propensity score matching was performed to minimise intergroup differences in baseline characteristics and 73 matched pairs were obtained.

Elbadawy et al; Eur J Vasc Endovasc Surg 2018



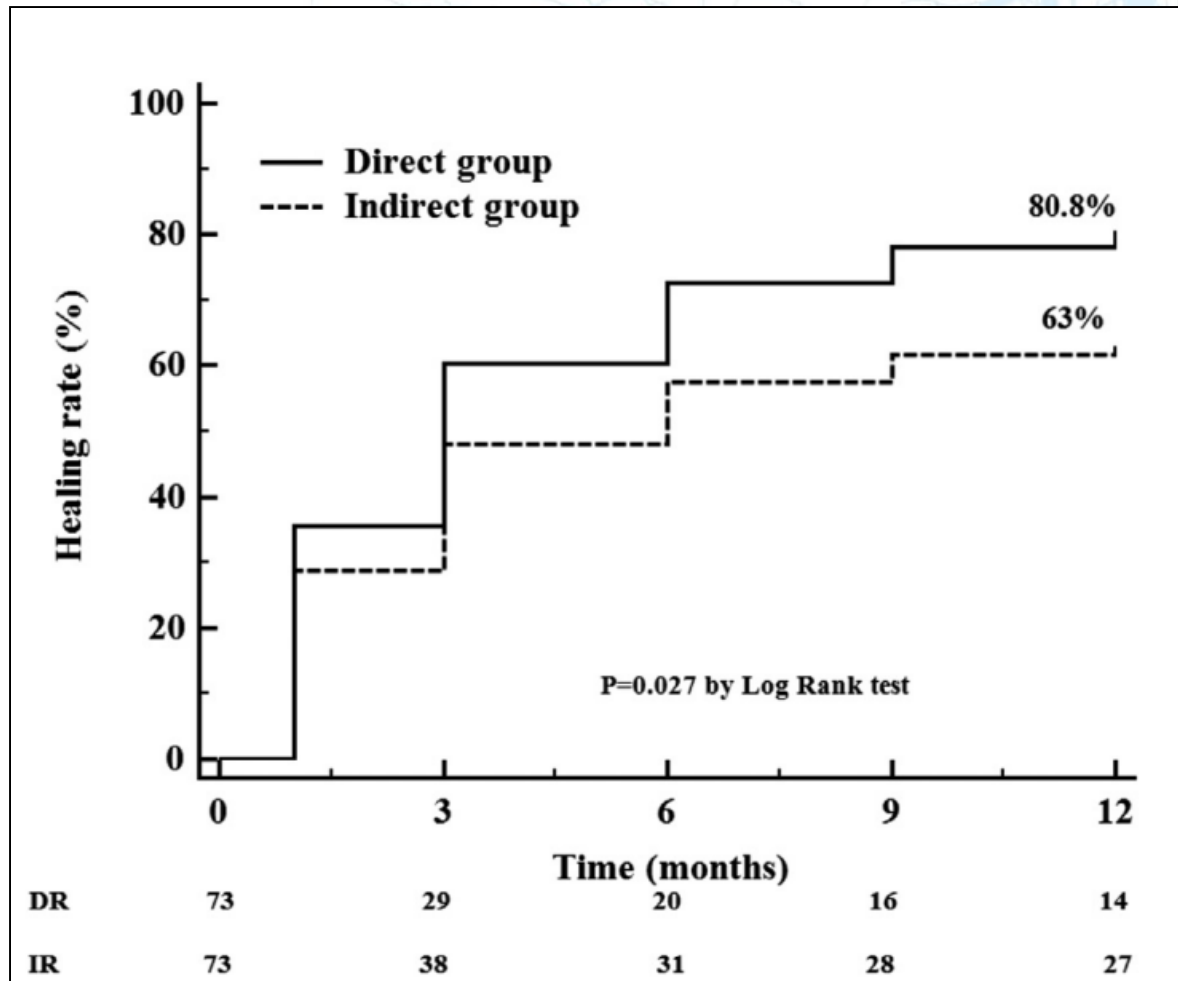


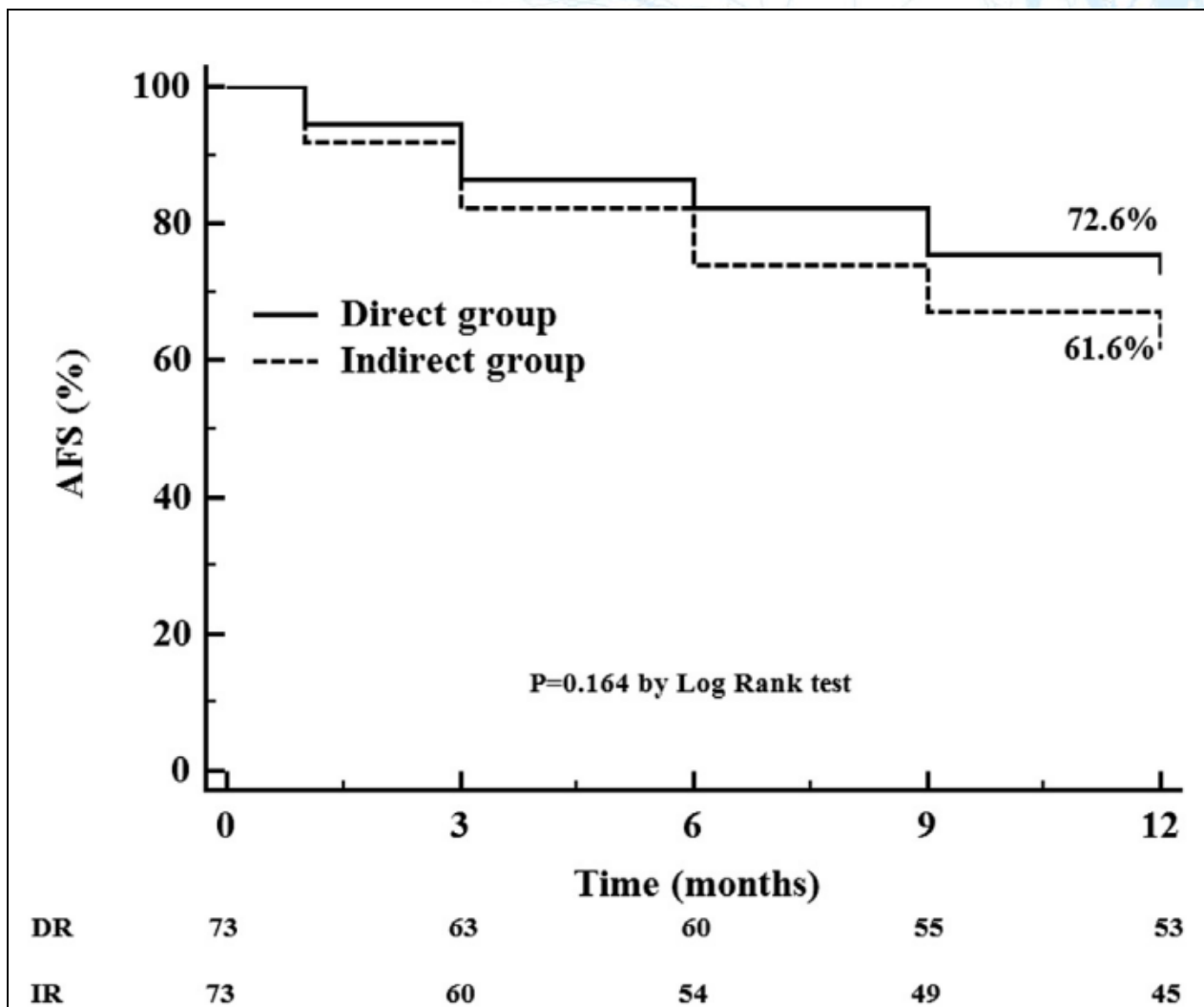
# Results

- 12 months after angioplasty the primary patency rates were 58% and 62% ( $p=0.756$ ) and complete wound healing 80.8% and 63% ( $p=0.02$ ) for the direct revascularization and indirect revascularization groups respectively (angiosome concept).

Elbadawy et al; Eur J Vasc Endovasc Surg 2018







- Multivariate analysis demonstrated that the revascularization method (adjusted HR 1.61) and Rutherford classification (adjusted HR 0.53) were the only variables that independently affected complete wound healing.

Elbadawy et al; Eur J Vasc Endovasc Surg 2018





# Conclusions

- Complete healing of ischaemic tissue is a slow process even after a successful revascularization
- Angiosome targeted revascularization appears to improve healing rate of ischaemic ulcers



# Conclusions

- Wound healing is a complex multifactorial process. We believe that it is an important patient- centered outcome and it should be included in studies evaluating patients with ulcers and CLI.





ΠΑΝΕΠΙΣΤΗΜΙΑΚΟ ΓΕΝΙΚΟ ΝΟΣΟΚΟΜΕΙΟ

ΑΤΤΙΚΟΝ



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