

Quantification of the effect of Lipo-PGE₁ on angiogenesis

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** We have nothing to declare.*

Current Use of Lipo-PGE₁

- *Introduced in clinical practice* -Carlson, 1973-

- Improves cutaneous microcirculation -Suzuki S, 1987-
- *On blood flow, viscosity, fibrinolysis, platelet aggregation* -Schrör, 1997-
- Potent hemodynamic effect in heart failure -Pacher, 1997-
- Reduce ischemia/reperfusion injury -Huk, 2000-
- *Improve hemodynamic effects in heart failure/transplantation*
-Pacher, 1997; Haider, 2005-

- *Diabetic neuropathy, leg ulcers* -Toyota, 1993-
- Pph. arterial occlusive disease (PAOD) -Weiss, 2003-
- Diabetic murine hindlimb ischemia -Huang, 2008-
- *Pulmonary hypertension & PAOD* -Weiss, 2005-
- Collagen related skin ulcer -Murota, 2008 -
- *Renal injury* -Stanek, 1997-

Purpose

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ELSEVIER



Successful composite graft for fingertip amputations using ice-cooling and lipo-prostaglandin E1[☆]

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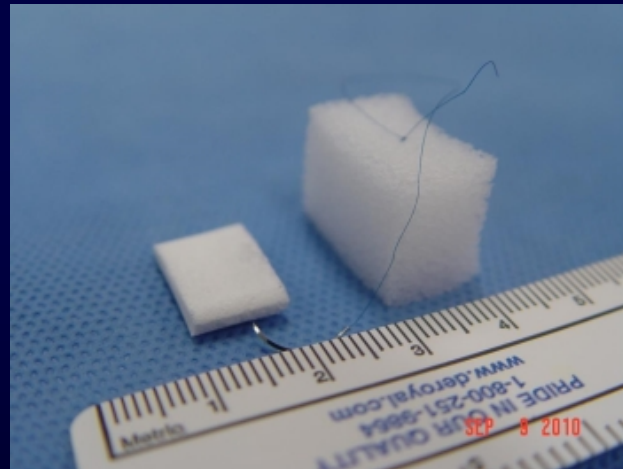
: To confirm our previous report experimentally & scientifically

Materials and Methods

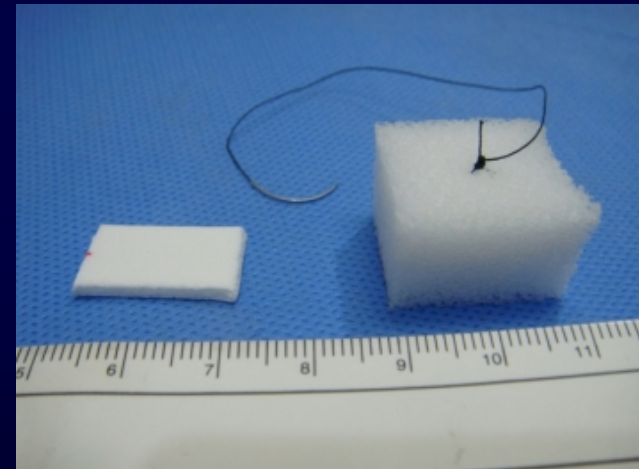
- 15 New Zealand white rabbits
- 2 groups
 - 8 experimental, 7 control
- Anesthesia
 - 5% Ketamine hydrochloride, 60 mg/kg
- Scaffolds implanting (S.C.) in the back
 - Merocel[®]
 - AlloDerm[®]
- Lipo-PGE₁ (Eglandin[®]) IV for 2 wks
 - Ear ; marginal veins
 - 3 $\mu\text{g}/\text{kg}/\text{day}$



Merocel[®] as a scaffold (Standard Nasal Dressing)



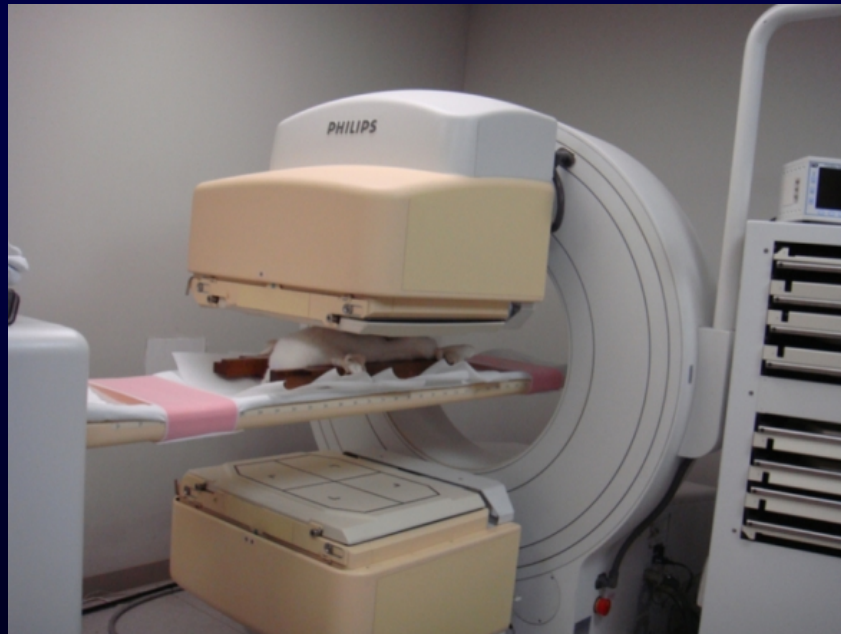
1 X 2 X 1.5 cm



2 X 2 X 1.5 cm

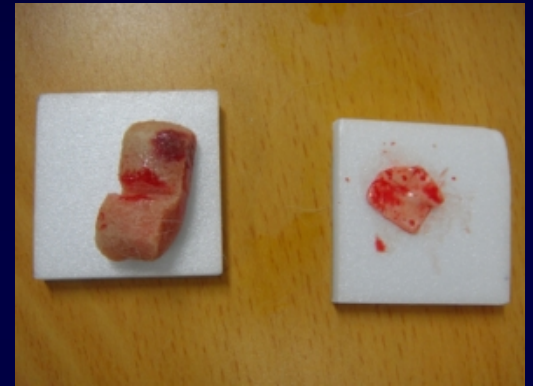
$^{99m}\text{TcO}_4^-$ clearance technique

- Mean clearance half time ($T_{1/2}$)
 - At post-implant 2 wks
 - Washout of radioactivity
 - Collimated gamma-scintillation camera for 30 min



Histologic examination

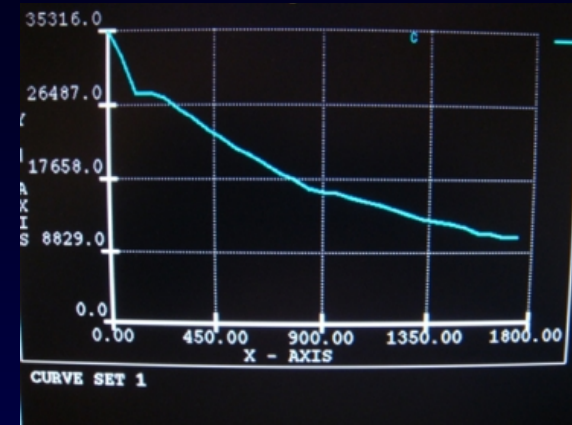
- Extraction of implants at postop. 2wks
 - Merocel[®], Alloderm[®]
 - Cut surface at the mid portion



- H & E staining
- Immunohistochemistry
 - CD31 (DAKO, Glostrup, Denmark) staining
 - counting of the new vessels under light microscopy (x400)
: 10 sites of HPF
- Statistical analysis
 - co-variants (ANCOVA) test by a specialist

RESULTS

$^{99m}\text{TcO}_4^-$ clearance rate



- Mean clearance half time ($T_{1/2}$)

- in 1 X 2 X 1.5 cm ($p = 0.0125$)

- : 4005 ± 2161.3 (test), 13840 ± 4644.6 (control)

- in 2 X 2 X 1.5 cm ($p = 0.0413$)

- : 1560 ± 1174.7 (test), 3405 ± 807.03 (control)

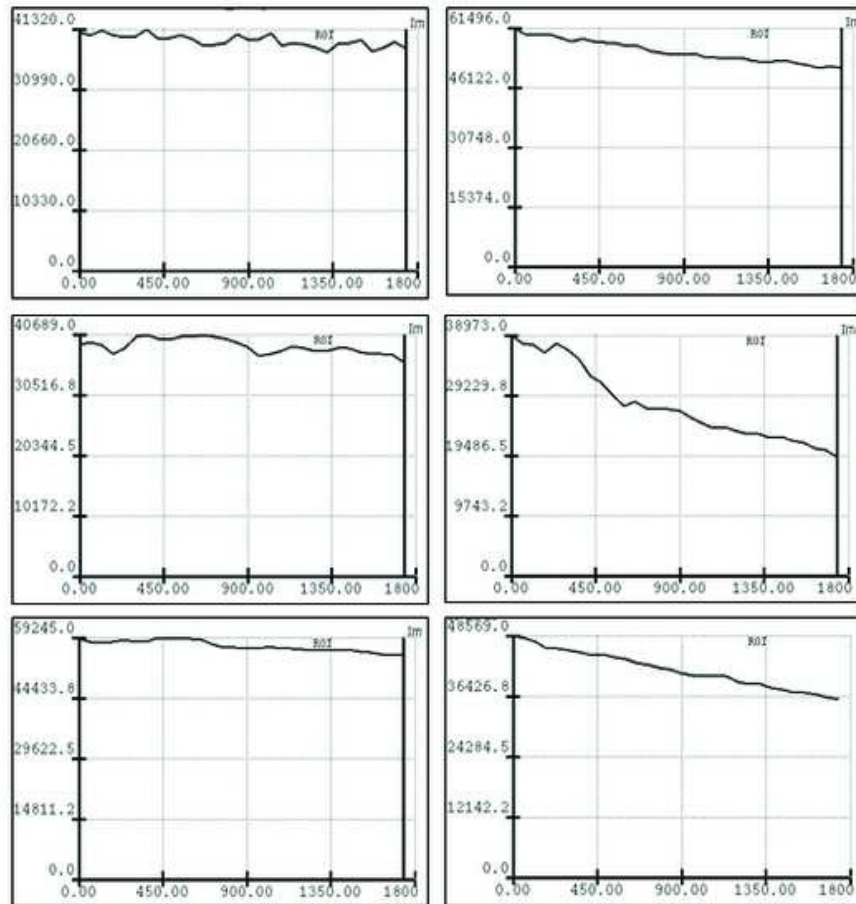
- Variance depended on the matrix size

$^{99m}\text{TcO}_4^-$ clearance rate

1 X 2 X 1.5 cm³

2 X 2 X 1.5 cm³

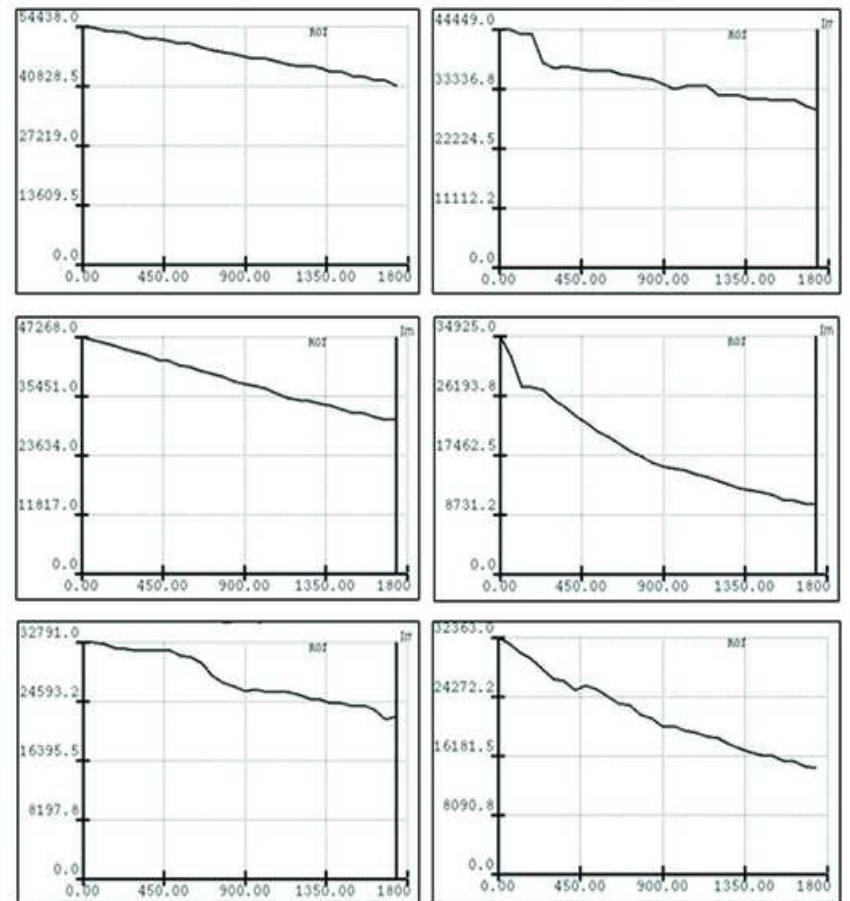
A



Control group

Experimental group

B



Control group

Experimental group

in 2 different sized Merocel[®]

Histological examination

(measurement of newly formed blood vv.)

● Merocele[®] matrix

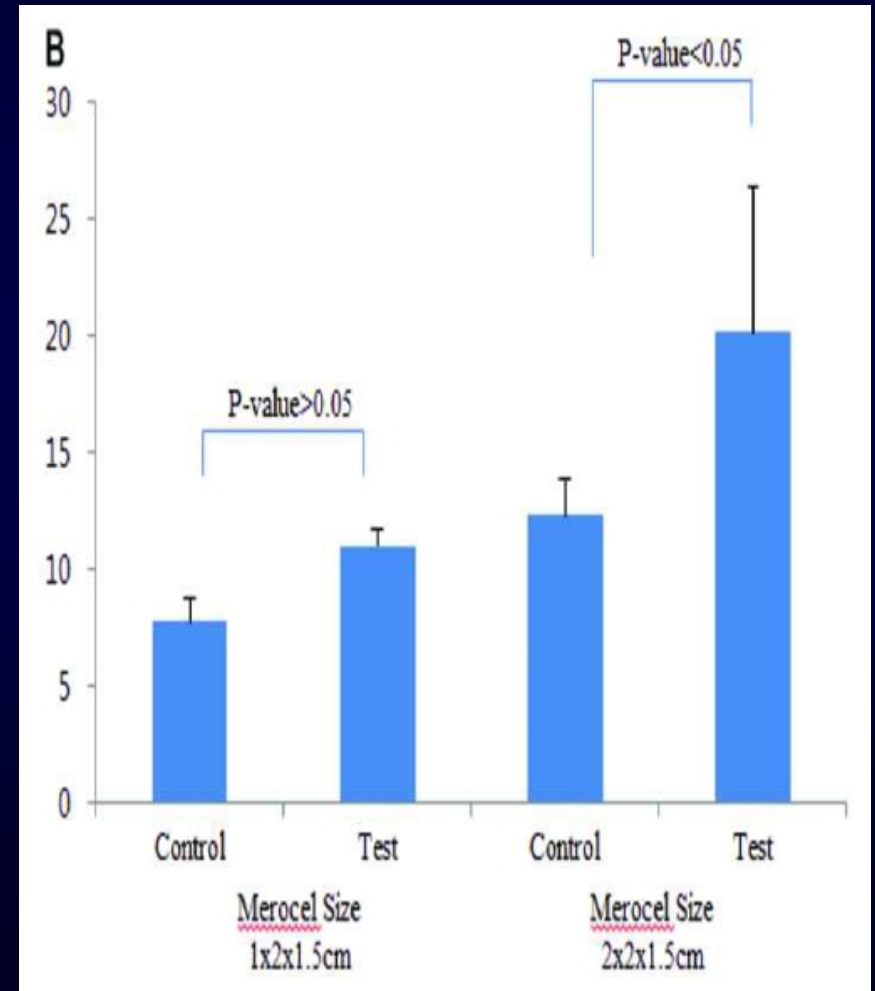
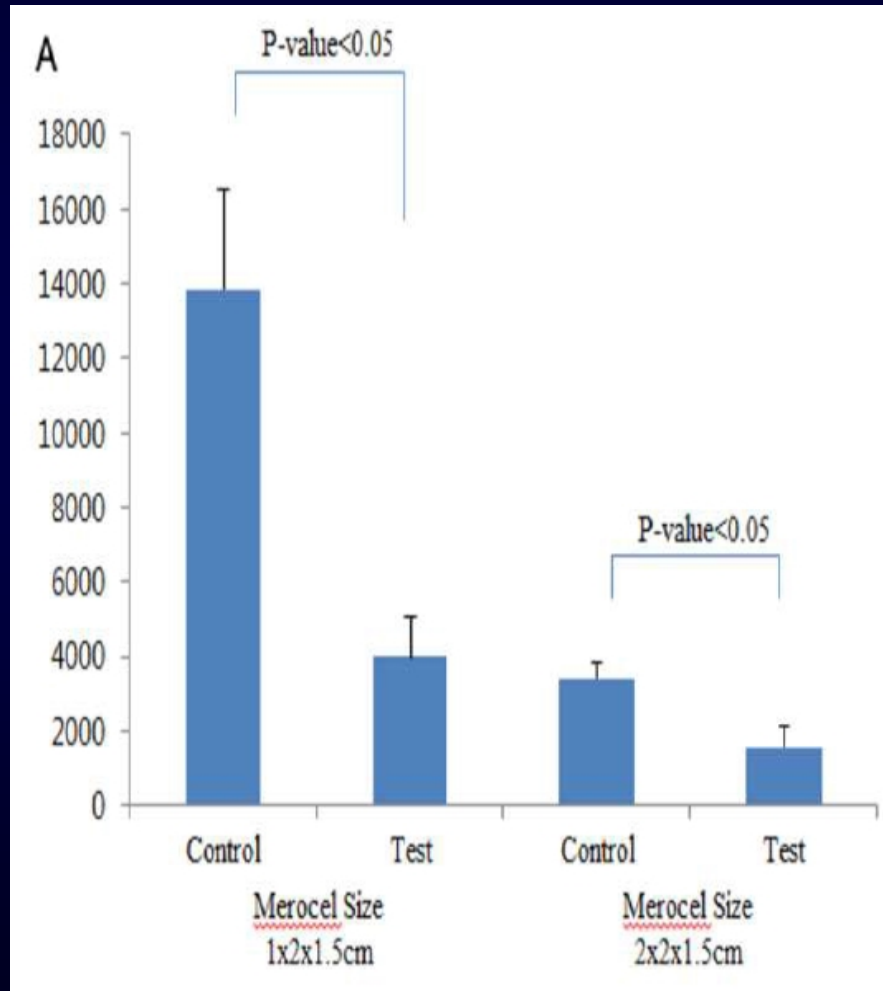
- in 1 X 2 X 1.5 cm (p = 0.0501)
: 11 ± 1.58 (test), 7.8 ± 1.71 (control)
- in 2 X 2 X 1.5 cm (p = 0.02679)
: 20.19 ± 12.47 (test), 12.33 ± 3.25 (control)

● Alloderm[®] matrix

- statistically unavailable
- small in numbers at 2 weeks

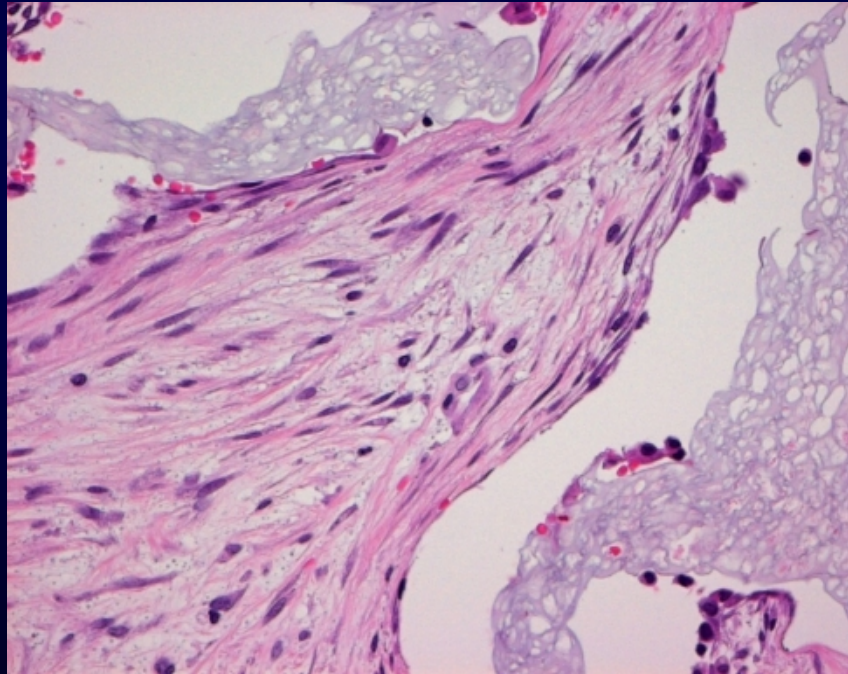
(A) $^{99m}\text{TcO}_4^-$ clearance half time

(B) # of newly formed vvs. from Merocel[®] implants

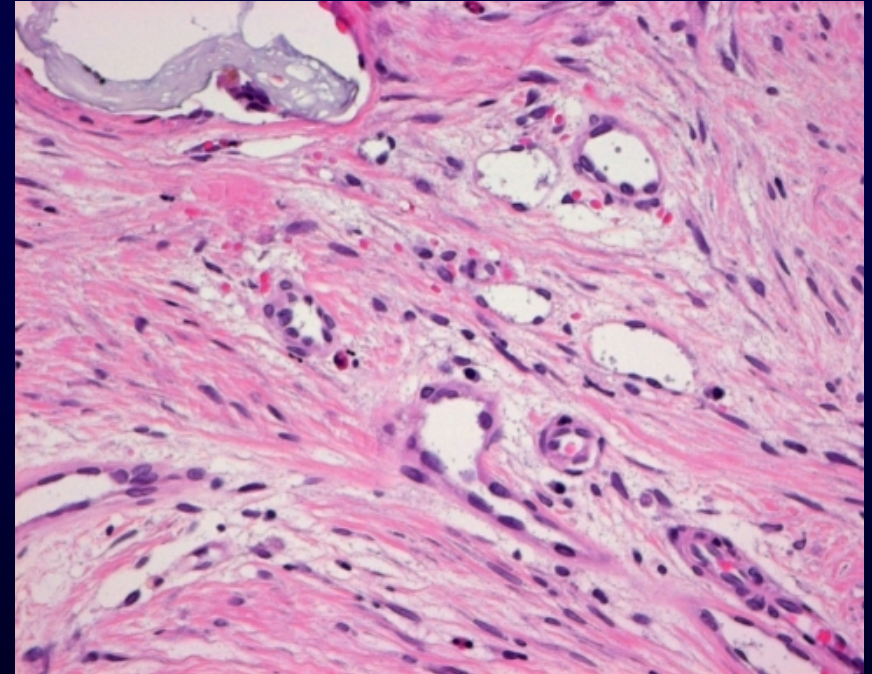


Histopathology - H&E - (Meroce1[®])

Control group



Lipo-PGE1 group

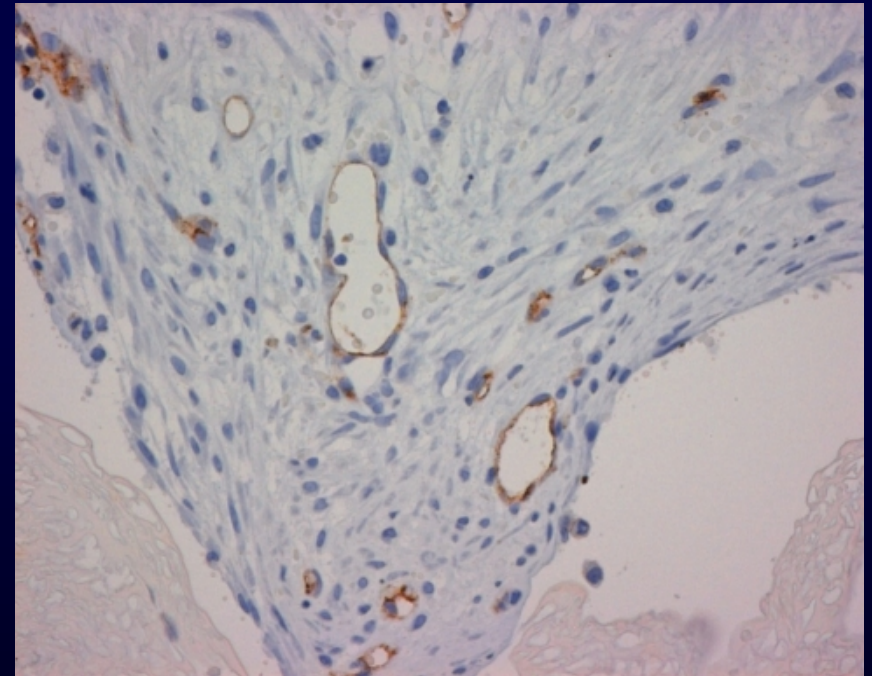
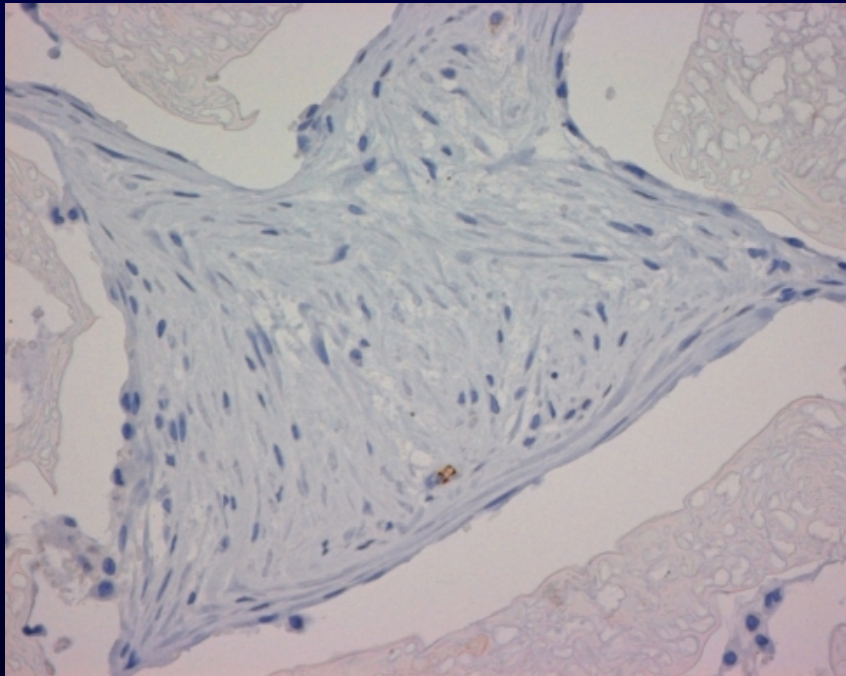


X 400

Immunohistochemistry - CD31 - (Merocel[®])

Control group

Lipo-PGE1 group



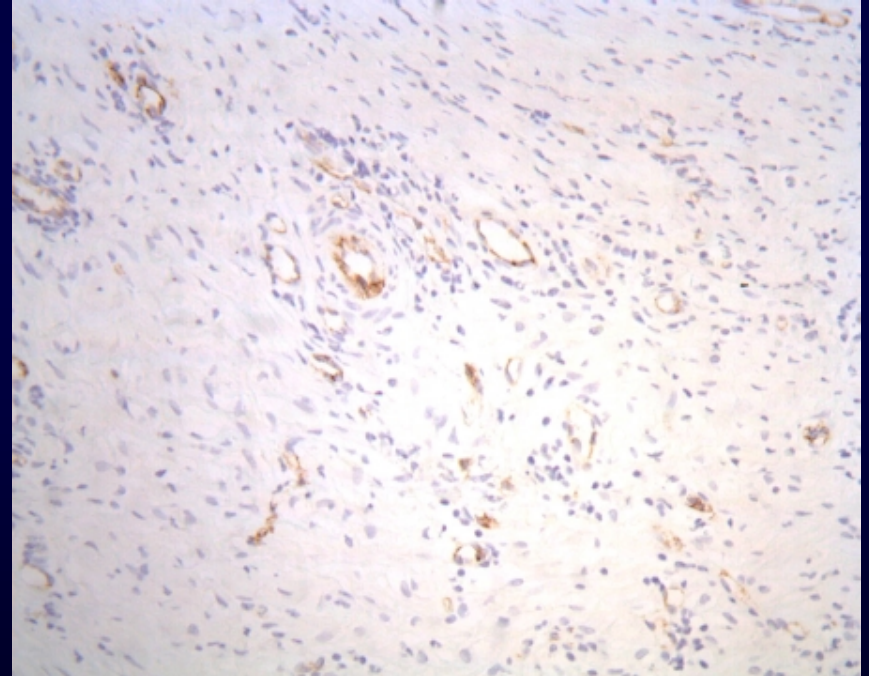
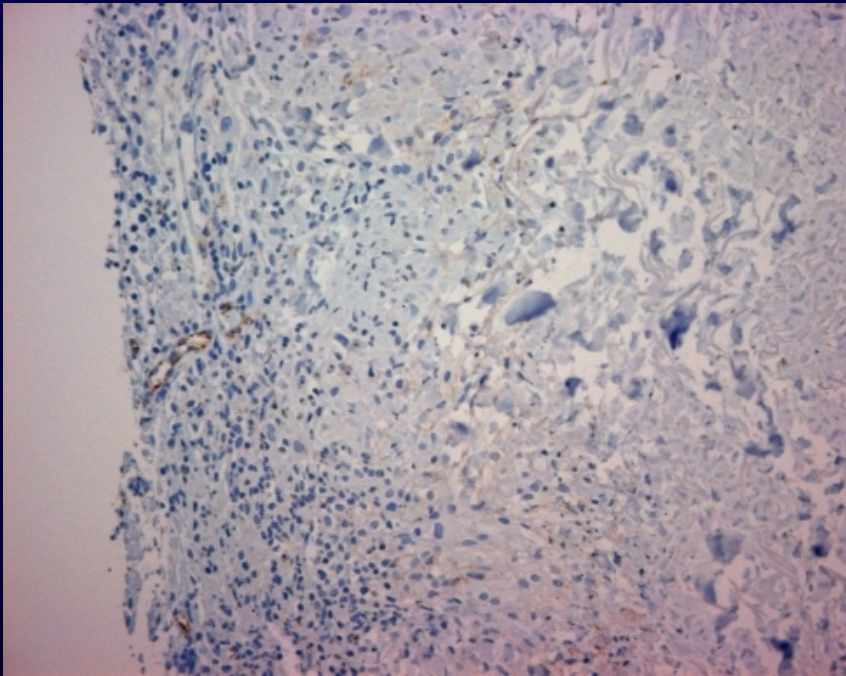
X 400

Immunohistochemistry

- CD31 - (Alloderm[®])

Control group

Lipo-PGE1 group



X 200

of vessels failed to show a significant difference between 2 groups.



Conclusion

Lipo-PGE₁ (Eglandin[®])

= Alprostadil[®] (PGE₁) + Lipid microsphere

- **Effective in angiogenesis**

- Composite graft survival
in unreplantable fingertip amputation

- **Improves microcirculation**

