

Microvascular anastomosis without microscope: experimental study for application to austere environments



- **Conflict of interest: none**

- **Research involving animals**

Approved by the regional Ethics Committee for the Use of Animals of the Paris V Descartes University.

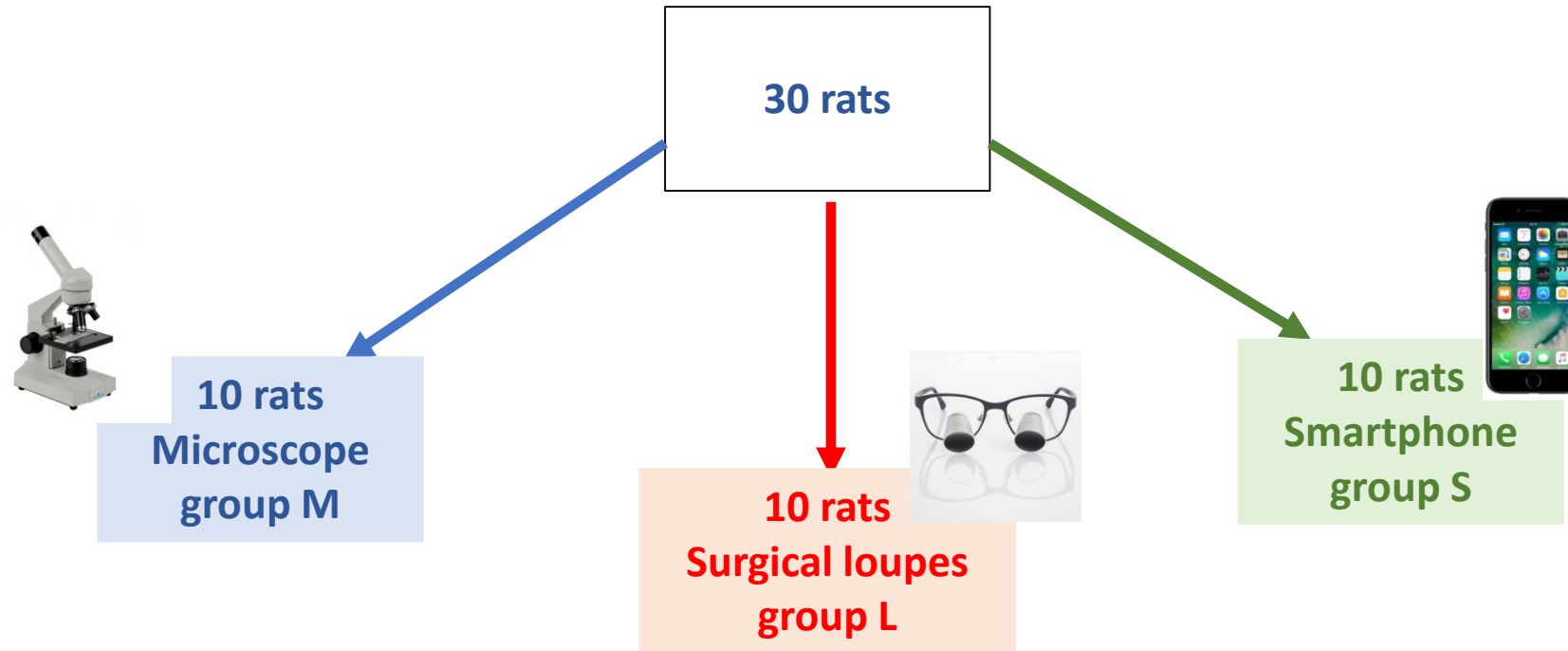
- **Funding:** no financial support for the research

Introduction



- Hand injuries = among the most common during mission
 - difficult to handle
 - lack of a microscope
- Digital replantings with only surgical magnifiers by deployed orthopaedic surgeons

Equipment and methods



same operator

sub-renal abdominal aorta was **dissected** under a **microscope**

anastomosed by separate points using the **group-specific magnifying instrument**



Evaluation of the anastomose

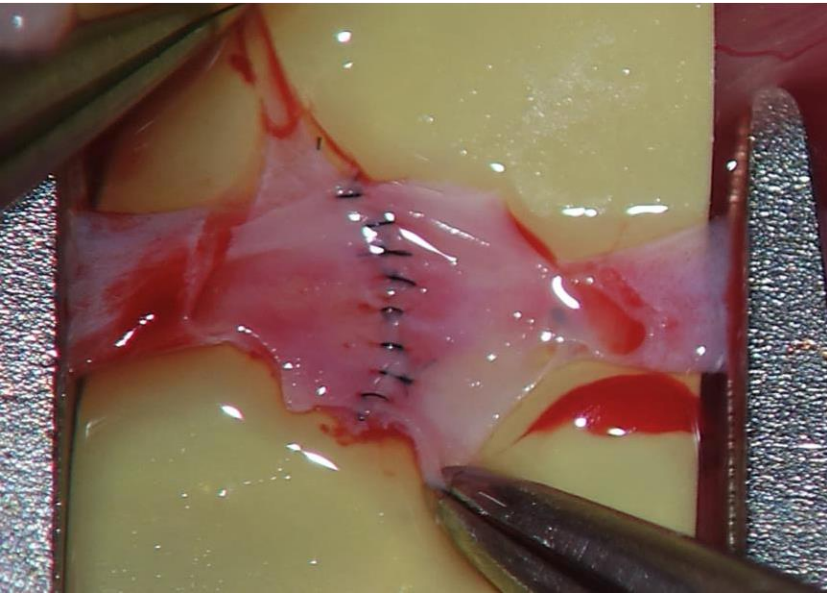
3 minutes
(T1)

- Immediate permeability
Acland permeability test

1 hour
(T2)

- Delayed permeability
Acland permeability test
- Quality of the anastomosis
Longitudinal arteriotomy

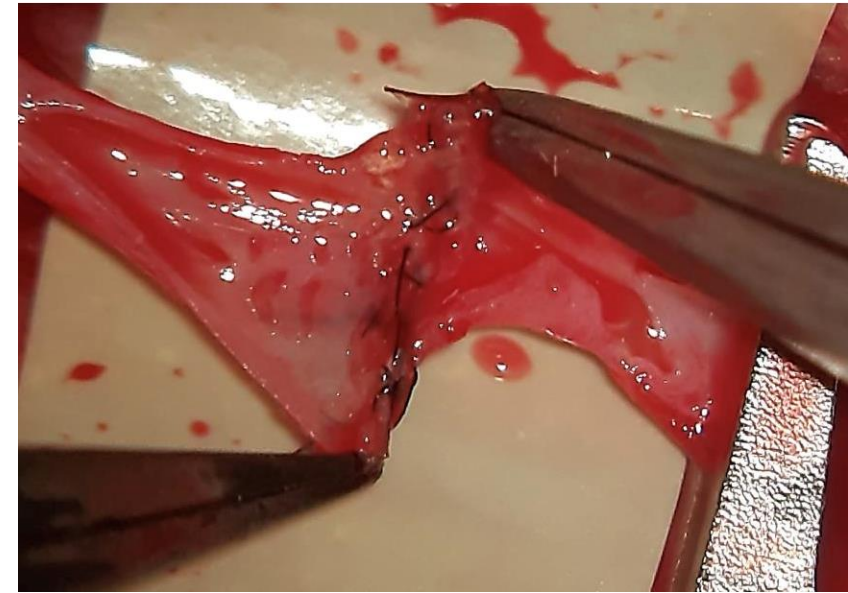
Group M



Group L



Group S



Results

	Group M	Group L	Group S	P-value
Weight (g), mean ± SD	284 ± 67	296 ± 68.5	245.5 ± 19	0.18
Aorta caliber (mm), mean ± SD	1.19 ± 0.17	1.22 ± 0.17	1.3 ± 0.16	0.35
Anastomosis time (min), mean ± SD	20.1 ± 15.7	20.3 ± 16.5	50.2 ± 16.9	< 0.001
Amount of stitches, mean ± SD	8.3 ± 0.48	8.4 ± 0.5	8.4 ± 0.46	0.97
Blood leak, mean ± SD	0.1 ± 0.7	0.5 ± 0.7	1.1 ± 0.8	0.0045
Patency T1	10/10	10/10	3/10	0.003
Patency T2	10/10	10/10	2/10	<0.001

Conclusion

Anastomosis of digital arteries is possible under surgical loupes
Lower quality and higher risk of secondary thrombosis.

Surgical loupes allow the management of digital devascularisation in
degraded health situation

Nowadays the use of smartphones does not allow micro vascular repairs in
the living model

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