

MICROSURGICAL ANASTOMOSIS TECHNIQUES' PRESSURE RESISTANCE AND LEAKAGE COMPARISON ON NON-LIVING MODELS

Szabó Balázs, Norbert Németh

Department of Operative Techniques and Surgical Research, Faculty of Medicine, University of Debrecen

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Aims: Several microsurgical anastomosis techniques can be used depending on the goal of the surgery, available time, and the vessel geometry. Training is indispensable to create leakage free and conductive anastomoses. In this study we compared simple interrupted, continuous and the Lauritzen-"sleeve" suture techniques.

Methods: Each technique where completed ten times on femoral artery of chicken thigh biopreparate. The following parameters were measured: suturing time, stitch number, vessel diameter, leakage and pressure resistance. The vessel was clamped and the proximal part were cannulated. For the pressure measurement we used an infusion bag filled up with diluted Betadine solution (for better visualization). A manual blood pressure monitor was used for measuring. The pressure was raised up to 280 mmHg, and then the pressure drop was followed-up for five minutes, and video recording were taken as well.

Results: The average diameter of the arteries was 3.25 ± 0.38 mm. The interrupted suture needed 13.1 ± 2.4 stitches, and it took 45.6 ± 10.1 minutes to complete, the continuous suture 15.1 ± 1.4 stitches were used and it took 30.8 ± 5.9 to finish it ($p < 0.001$ vs. interrupted), the "sleeve" technique needed 6.4 ± 1.1 sutures and took 21.4 ± 1.9 minutes to complete ($p < 0.001$ vs. continuous). The pressure drop in the same order: 40.2 ± 12.8 mmHg; 39.6 ± 9.8 mmHg; 57.3 ± 18.6 mmHg drop ($p = 0.034$ vs. interrupted, $p = 0.019$ vs. continuous).

Conclusions: Although the sleeve technique was the fastest, it had the highest pressure drop and on these vessels we had to modify the technique as well. This measuremental setup can help to make an objective judgment of the anastomoses at training courses.