Clinical and Pathological Assessment of Different Suture Techniques for Vascular Anastomosis in Rat Femoral Artery

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Abstract:

Objectives: The study design aimed to examine the differences in the clinical and pathologic features after vascular anastomoses of a rat femoral artery using four different suture techniques. Methods: Sixty Sprague-Dawely rats were divided randomly into four groups. Fifteen bisected arteries (one from each animal) in groups I, II, III, and IV were sutured with the simple interrupted suture, continuous suture, sleeve suture, and cuff suture, respectively. Results: The anastomosis times in groups I, II, III and IV were 28.67, 14.67, 15.47, and 15.93 minutes, respectively. Immediate bleeding that stopped without intervention (grade I) was observed in 67%, 73%, and 60% of the anastomosed vessels in groups II, III, and IV, respectively, whereas 60% of the vessels in group I showed light bleeding that was inhibited by gentle pressure (grade II). All vessels examined appeared to be patent at 5 and 15 minutes after the anastomosis. On the seventh day postoperatively, the vessels of group I showed the highest patency rate (93%) compared with groups II (67%), III (73%), and IV (87%). Moreover, there were more pronounced pathologic changes in group I than in the other groups. These changes included endothelial loss, endothelial proliferation, degeneration, and necrosis of the tunica media. Suture materials surrounded by an inflammatory reaction were also observed. Conclusions: The simple interrupted suture is preferable for vascular anastomosis due to its highest patency rate. The other techniques investigated can be good alternatives because of their short anastomotic time and moderate pathological changes.

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