

# Argon laser-welded bovine heterograft anastomoses.

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## Abstract:

UNLABELLED: This study evaluated the strength of laser-welded arteriovenous shunts established using St. Jude BioPolyMeric vascular grafts. The arterial anastomoses of the biological graft were laser welded with and without the addition of soluble collagen or fibrin sealant. In four dogs, 16 arteriovenous grafts were implanted between the femoral artery and vein or the carotid artery and jugular vein using a 6 cm long, 4 mm internal diameter prosthesis. The 16 arterial anastomoses were evenly divided into four groups: sutured control, laser welded (LW), LW with soluble collagen applied immediately before and during welding, and LW with fibrin sealant applied after welding. All arterial control and venous anastomoses were sutured using continuous 6-0 polypropylene suture. All LW anastomoses were initially divided into six 5 mm long segments using six evenly spaced 6-0 polypropylene stay sutures. Each segment was laser welded using 15 to 18 5-sec pulses of the 0.5 W (7.5 W/cm<sup>2</sup>) argon laser energy delivered via a 300  $\mu$ m fiber while cooling the tissue with slow-drip saline irrigation. Blood flow was established and maintained through each anastomosis for 1 h. The vessels were then controlled, and anastomotic bursting pressure was determined with infusion of heparinized blood.

RESULTS: An additional hemostatic suture was required in 3 LW anastomoses (2 LW, 1 LW with collagen). Mean bursting pressures (mm Hg) of the arterial anastomoses were as follows: sutured controls 165  $\pm$  159, LW 144  $\pm$  58, LW and collagen 93  $\pm$  47, LW and fibrin sealant 181  $\pm$  45.(ABSTRACT TRUNCATED AT 250 WORDS)