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LOCKED TEMPORARY VASCULAR SHUNT

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Statement of the Problem: To reduce the ischemia time of injured limbs in wartime, temporary vascular shunts (TVS) are commonly used. However, TVS are stabilized at the ends of the injured vessels using manual suture ties, the risk of dislodgement is high, and tightening manual suture ties is too time consuming.

Methodology & Theoretical Orientation: Locked temporary vascular shunts (LTVS) were designed, and each was composed of a silicone tube with a threaded outer surface and smooth inner surface in addition to two nylon buckle switches. The buckle switches were used to stabilize the silicone tube of the LTVS with respect to the vessel walls. This job was performed with two manual suture ties with the current TVS.

Findings: The mean bursting pressure value of the veins shunted with the LTVS was 114.3% higher than that of the veins shunted with the TVS (0.045±0.008 MPa vs. 0.021±0.012 MPa; p=.00). Although the mean shunting time of the LTVS was reduced by 60.4% compared with that of the TVS (138.89±18.22 seconds vs. 350.48±52.20 seconds; p=.00), there was no significant difference in the patency times between the two types of devices (8.20±9.01 hour vs. 8.40±8.85 hour; p=.98).

Conclusion & Significance: The LTVS, which was designed to treat wartime vascular injuries, might be safer and more efficient than the current TVS.

Recent Publications

1. Guoxian Pei and Haibo Lu (2010) Bone Allograft Transplantation. Beijing: Scientific and Technical Literature Publishing House 2010. ISBN: 9787502356392.
2. Haibo Lu, Quanyi Guo, Shibi Lu, and Yong Xu (2010) Systematic review of extremity vascular injury in modern wars. Prospero 2011, review protocol, CRD42011001729.
3. Haibo Lu, Guoxian Pei, Peiran Zhao, Shuangwu Liang, Dan Jin, and Shan Jiang (2010) Cyclosporine-impregnated allograft bone sterilized with low-temperature plasma. Journal of Tissue Engineering and Regenerative Medicine 4(8):638-51.
4. Haibo Lu, Xin Wang, Wenlong Gou, Jian Zhang, and Shibi Lu (2016) Locked temporary vascular shunt for wartime vascular injuries. EJVES Short Reports 2016. 33: 9-12.
5. Haibo Lu, Haoye Meng, Shibi Lu, Ling Qin, Bin Zhao, Aiyuan Wang, Jiang Peng, Wenjing Xu, Quanyi Guo, and Jian Zhang (2017) Freeze-dried and irradiated allograft bone combined with fresh autologous coagula promotes angiogenesis in an ectopic bone allograft implantation model. Connective Tissue Research doi: 10.1080/03008207.2017.1353977

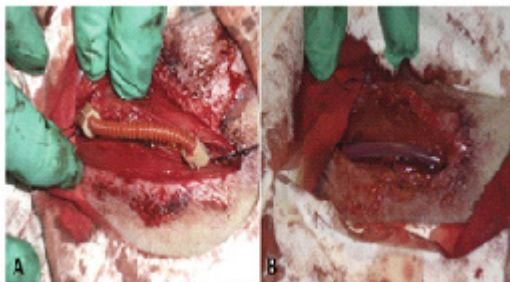


Figure 2. Injured arteries shunted using (A) a locked temporary vascular shunt (LTVS) or (B) a temporary vascular shunt.

Biography

Haibo Lu has his expertise in wartime extremity vascular injury rescue, surgical treatment for senior hip fracture and bone-allograft scaffolded tissue engineering. Most of his innovations are derived from clinic problems and factual demands from combat environment. His contexture innovation of vascular shunt might be a novel attempt to vascular repairing

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