

Arterialization of the Venous System for Salvage of Critical Hand Ischemia

Tianyi Liu, MD; Edward Buchel, MD; Leif Sigurdson, MD, MSc, MBA; Thomas Hayakawa, MD; Avinash Islur, MD

Abstract

Purpose: Limited salvage options exist for critical hand ischemia secondary to distal arterial disease, which are not amenable to bypass. Arterialization of the venous system in the upper extremity has recently regained attention, however only scattered cases are reported in the literature¹⁻³. Our study aims to determine the outcome of venous arterialization to assess its clinical feasibility in limb salvage.

Method: All patients who underwent venous arterialization for acute and chronic hand ischemia at a single institution were retrospectively reviewed. Indications, operative details, preoperative and postoperative findings as well as requirement of further amputation were studied. Furthermore, the patency of anastomoses, and the pattern of perfusion were assessed prospectively on follow up by clinical exam, doppler and duplex ultrasound.

Results: A total of 8 hand arterializations were performed in 6 patients with mean age of 55 (range 33 to 75) who presented with severe ischemic pain of the hand and clinical evidence of arterial vascular insufficiency. There were 2 hands with acute ischemia (symptoms under 1 week) and 6 with chronic symptoms. Etiology includes atherosclerosis (4), Raynauds disease (2), distal embolic arterial occlusion secondary to IV drug use (1), and distal arterial aneurysm and diffuse narrowing due to Buerger's disease (1). All cases were distal arterial occlusions not amenable to bypass that were confirmed on pre-operative imaging. The cephalic vein was placed end-to-side into the radial artery in the vicinity of the wrist in all cases. During a mean follow-up period of 6.8 months (range 1.5 to 17), all patients exhibited immediate pain reduction, and demonstrated ischemic ulcer healing, improved range of motion and/or sensation. All arterialized hands survived. Two patients presenting with acute ischemia required fingertip amputations for ischemic changes that were irreversible despite venous arterialization. Prospectively, 7 hands in 5 patients were evaluated. All hands showed arterial doppler and duplex ultrasound signals at anastomosis, dorsal veins and at least one digital arteries to the pulp, with O₂ saturation >94% to all fingers.

Conclusions: Our study is the largest series to demonstrate that venous arterialization may be a valuable salvage option in the setting of acute and chronic arterial ischemia of the hand when traditional forms of revascularization are not feasible.

References

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Disclosure/ Financial Support

None of the authors has any conflict of interest or financial support to disclose.