Hand replantation: A rare case report

Magdy M El-Sayed Ahmed

Abstract
We report a case of a hand replantation. A 43-year-old male presented with an amputated right hand. After clinical and radiological examination of the amputated hand and the forearm stump, the patient was consented for hand replantation procedure. Both bones of the forearm were fixed using K-wires. Careful dissection, trimming and repair of the tendons, vessels (two arteries and one vein) and nerves was achieved. The patient tolerated the procedure well and 2 months later showed a progressive improvement in motor and sensory functions. We suggest that a single-vein repair is sufficient for a successful hand replantation.

Keywords
Hand replantation, amputated hand, vein

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Case report
We report a 43-year-old male who presented with an amputated right hand (Figure 1). After clinical and radiological examination of the amputated hand and the stump, the patient was consented for hand replantation. Careful dissection and debridement of the neurovascular structures both proximally and distally and a 1-cm bone shortening of both bones on the amputated hand side was done. Afterward, both forearm bones were fixed by four K-wires. Meticulous repair of the radial and ulnar arteries and the cephalic vein was accomplished followed by repair of the three nerves of the forearm. Finally, tendons repair and skin closure was achieved. The patient tolerated the procedure well and 2 months later showed a progressive improvement in motor and sensory functions (Figure 2).

Discussion
The cephalic vein was the only vein repaired because the rest of the veins of the hand were either too small or badly damaged. While this replanted hand survived on a single-vein repair, Weiland described that a ratio of 2 veins to 1 artery repair is required to improve the outflow and increase the chances of the hand survival. Also, other authors recommended to repair more than a single vein. The cut end of the two bones on the amputated hand side was ragged and sharp so about 1 cm of the two bones was resected. Bone shortening facilitated the neurovascular structures repair without grafts. The distal radio-ulnar joint was about 3–4 cm away from the trauma site so integrity of the joint was preserved. Regarding the outcome of the sensory and motor function recovery, several reports have revealed favorable results following hand replantation, including of Hoang, who reported five consecutive hand replants in young male patients with clean-cut injuries at the level of radiocarpal joint resulting in 70%–80% of total active motion in the digits and thumb and 8–12 mm of static two-point discrimination. The best results have been seen in children with the recovery of as much as 90% of total active motion and 5–7 mm of static two-point discrimination. In our patient, the follow-up period is 2 months, so complete assessment of the sensory and motor function recovery is not feasible at this time period. However, the patient has started to exhibit flexion and extension movements at the wrist, metacarpophalangeal and interphalangeal...

1Department of Cardiovascular Surgery, Texas Heart Institute, St. Luke’s Episcopal Hospital, Houston, TX, USA
2Department of Surgery, Zagazig University Faculty of Medicine, Zagazig, Egypt

Corresponding author:
Magdy M El-Sayed Ahmed, Department of Cardiovascular Surgery, Texas Heart Institute, St. Luke’s Episcopal Hospital, 6770 Bertner Avenue, Houston, TX 77030, USA.
Email: elgoharymagdy@yahoo.com
We conclude that in our procedure, single-vein repair was sufficient for survival of a replanted hand; however, we recommend utilizing more than a single-vein repair, if possible, for a better chance of survival of the hand.

**Ethics**

The Ethical Committee approval was sought for this article.

**Declaration of conflicting interests**

The author has no conflict of interest to disclose and no relationships to industry related to this research.

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