Allograft Reconstruction for Digital Nerve Loss

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Purpose To investigate the outcomes of digital nerve repairs using processed nerve allograft for defects measuring 30 mm or less.

Methods Seventeen patients with 21 digital nerve lacerations in the hand underwent reconstruction with processed nerve allograft. (Figure 1) Outcome data for 14 patients with 18 digital nerve lacerations were available for analysis. Postoperative outcome data were recorded at a minimum of 12 months and an average of 15 months. The average nerve gap measured 11 mm (range, 5-30 mm). Outcome measures included postoperative sensory examination as assessed by Semmes-Weinstein monofilaments and static and moving 2-point discrimination. Pain was graded using a visual analog scale throughout the recovery period. In addition, patients completed the Quick Disabilities of the Arm, Shoulder, and Hand survey before and after surgery.

Figure 1. The completed nerve reconstruction with allograft in place.
Results Using the Taras outcome criteria, 7 of 18 (39%) digits had excellent results, 8 of 18 (44%) had good results, 3 of 18 (17%) digits had fair results, and none had poor results. At final follow-up, Semmes-Weinstein monofilament testing results ranged from 0.08g to 279g. Quick Disabilities of the Arm, Shoulder, and Hand scores recorded at the patient’s first postoperative visit averaged 45 (range, 2-80), and final scores averaged 26 (range, 2-43). There were no signs of infection, extrusion, or graft reaction.

Conclusions The data suggest that processed nerve allograft provides a safe and effective alternative for the reconstruction of peripheral digital nerve deficits measuring up to 30 mm.

References (Allograft)


19. Hudak PL, Amadio PC, Bombardier C. Development of an upper arm extremity outcome measure: the DASH (Disabilities of the Arm, Shoulder, and Hand)
Reconstruction of Digital Nerves With Collagen Conduits
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Purpose Digital nerve reconstruction with a biodegradable conduit offers the advantage of providing nerve reconstruction while providing a desirable environment for nerve regeneration. Many conduit materials have been investigated, but there have been few reports of human clinical trials of purified type I bovine collagen conduits.

Methods We report a prospective study of 22 isolated digital nerve lacerations in 19 patients reconstructed with a bioabsorbable collagen conduit. (Figure 2) The average nerve gap measured 12 mm. An independent observer performed the postoperative evaluation, noting the return of protective sensation, static 2-point discrimination, and moving 2-point discrimination, and recording the patient’s pain level using a visual analog scale. Minimal follow-up was 12 months and mean follow-up was 20 months after surgery.

Figure 2. The nerve reconstruction with one nerve end sutured to the collagen conduit.

Results All patients recovered protective sensation. The mean moving 2-point discrimination and static 2-point discrimination measured 5.0 and 5.2 mm, respectively, for those with measurable recovery at final follow-up visit. Excellent
results were achieved in 13 of 22 digits, good results in 3 of 22 digits, and fair results in 6 of 22 digits, and there were no poor results. Reported pain scores at the last postoperative visit were measured universally as 0 on the visual analog scale.

Conclusions Our data suggest that collagen conduits offer an effective method of reconstruction for digital nerve lacerations. This study confirms that collagen conduits reliably provide a repair that restores nerve function for nerve gaps measuring less than 2 cm.

References (Collagen Conduit)

*Disclosure: Speakers’ Bureau, AxoGen, Inc.; Integra LifeSciences

Notes