

Utilizing Processed Nerve Allograft in Large Gap Peripheral Nerve Reconstruction in a Military Population

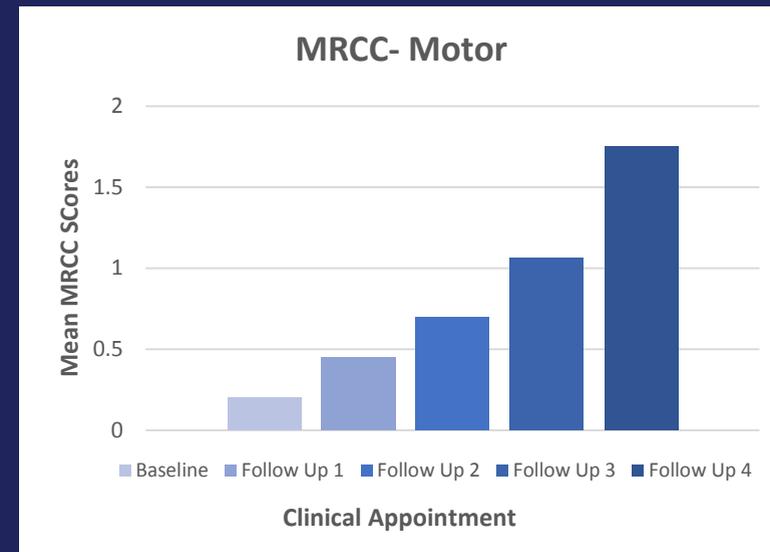
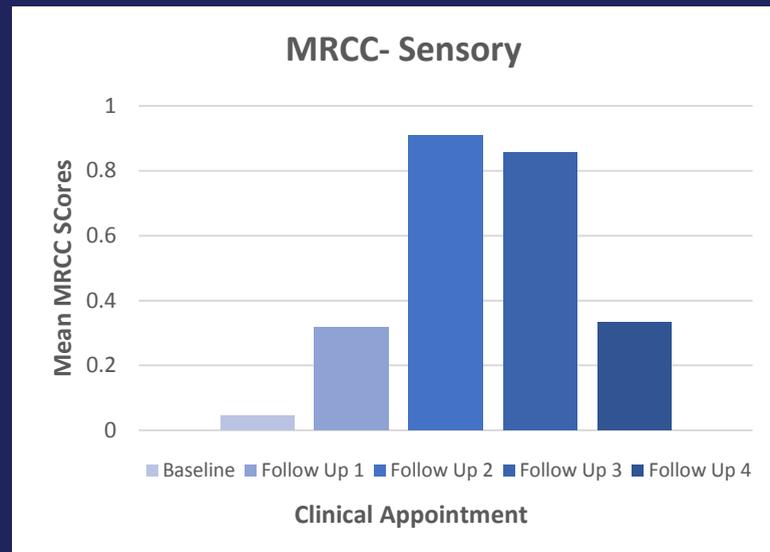
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Purpose

- Peripheral nerve allografts have become a commonly used treatment when a direct tension free nerve repair is not a viable option.
- Extremity injuries are the most frequent injuries sustained in combat.
- Peripheral nerve injuries represent one of the strongest predictors for separation from service.
- Goal:** Evaluate the functional motor and sensory outcomes of military service members treated with an acellular peripheral nerve allograft.

Methods

- Retrospective review of 22 patients treated with upper and lower extremity peripheral nerve injuries at WRNMMC from 2008-2014.
- Patients followed for up to 2 years after the surgery at standard intervals.
- Medical Research Council Classification (MRCC) scores calculated at each follow up appointment.



Figures A & B: MRCC average scores for both sensory (left) and motor (right).



Image A: Preoperative range of motion (Left Arm)

Distinguishing Study Features
Lowest mean age → prior studies show an association of better outcomes with older age
Largest mean defect size (>70mm) → Prior studies typically have gap length of ~25mm
Majority of patients injured with gunshot wounds or blasts → poorer outcomes associated with complex injuries in prior studies
50% were lower extremity injuries → prior studies indicate inferior prognosis in lower extremity injuries

Figure C: Distinguishing study features compared to other similar studies

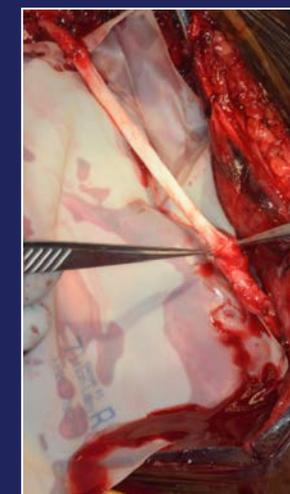


Image B: Acellular nerve graft

Results

- 59% achieved improvement from pre-operative baseline.
- 27% achieved meaningful recovery (MRCC score >M3 or S3).
- No adverse effects observed.

Conclusions

- Processed nerve allografts provided documented recovery in almost 60% of patients.
- These results represent a unique demographic when compared to other research, with a far younger and more severely injured patient population.
- Long term follow up remains a challenge in those with complex injuries.
- Our study reiterated that acellular nerve grafts are a safe and viable option in patients with peripheral nerve defects, offering hope to those who are devastated by large (>70mm) nerve gap injuries.