Reference

Souza J, Cheesborough J, Ko J, Cho M, Kuiken T, Dumanian G

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Targeted Muscle Reinnervation: A Novel Approach to Postamputation Neuroma Pain

Clin Orthop Relat Res (2014) 472:2984–2990.

Products

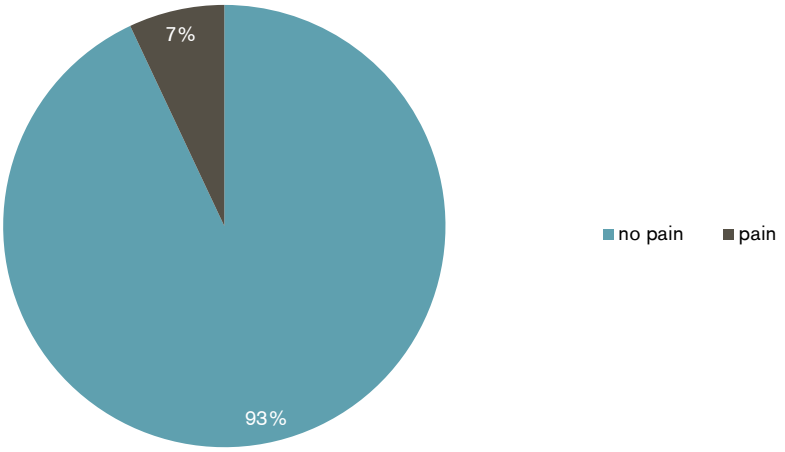
Myoelectric prosthesis in combination with Targeted Muscle Reinnervation

Major Findings

The effect of Target Muscle Reinnervation (TMR) on residual limb neuroma pain in upper-extremity amputees:

- → **None of the patients who underwent TMR demonstrated evidence of new neuroma pain after the procedure**
- → **93% of patients who presented with preoperative neuroma pain experienced complete relief of pain after TMR**
- → **88% of patients were able to operate a TMR-controlled myoelectric prosthesis**

% patients who had a pain relief after TMR



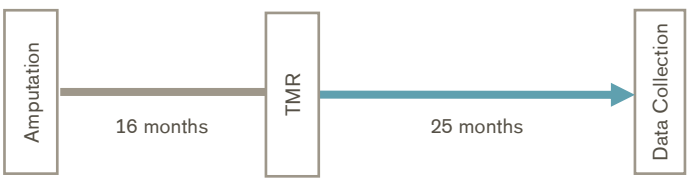
Of the 15 patients presenting with neuroma pain before TMR, 14 experienced complete resolution of pain in the transferred nerves.

Population

Subjects:	16 transhumeral and 10 shoulder disarticulation amputees
Amputation etiologies:	all trauma
Mean age at TMR:	32.8 ± 11.7 years
Mean time since TMR:	16.5 ± 14.6 months

Study Design

Retrospective study:



A retrospective medical record review of all 26 patients treated with TMR from 2002 to 2012 was conducted. The mean time between amputation and TMR surgery was 16 months. Mean follow-up was 25 months (range, 6–124 months).

Results

Body Function		Activity			Participation	Others	
Mechanics	**Pain**	Grip patterns / force	Manual dexterity	**Activities of daily living (ADL)**	Satisfaction and Quality of life (QoL)	Training	Technical aspect

Category	Outcomes	Results for TMR:	Sig.*
Pain	Neuroma pain	Of the 15 patients with neuroma pain after amputation, 14 (93%) experienced complete resolution of pain in the transferred nerves. However, one patient experienced substantial increase in pain.	n.a.
		None of the 11 patients who underwent TMR and did not have preoperative evidence of post-amputation neuroma pain developed neuroma pain after the procedure.	n.a.
Activities of daily living (ADL)	Prosthetic use	23 of the 26 patients (88%) were successfully fit with a TMR myoelectric prosthesis. In one patient the fitting failed due to persistent residual limb pain; a second patient was found to have a brachial plexopathy intraoperatively that prevented successful reinnervation; a third patient was not fit due to financial challenges. These three patients were still able to wear a non-TMR prosthesis.	n.a.

* no difference (0), positive trend (+), negative trend (–), significant (++/––), not applicable (n.a.)

Author's Conclusion

"None of the 26 patients who underwent TMR demonstrated evidence of new neuroma pain after the procedure, and all but one of the 15 patients who presented with preoperative neuroma pain experienced complete relief of pain in the distribution of the transferred nerves. TMR offers a novel and potentially more effective therapy for the management of neuroma pain after limb amputation." (Souza et al., 2014)