Targeted muscle reinnervation: a novel approach to postamputation neuroma pain.

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Abstract

Background: Postamputation neuroma pain can prevent comfortable prosthesis wear in patients with limb amputations, and currently available treatments are not consistently effective. Targeted muscle reinnervation (TMR) is a decade-old technique that employs a series of novel nerve transfers to permit intuitive control of upper-limb prostheses. Clinical experience suggests that it may also serve as an effective therapy for postamputation neuroma pain; however, this has not been explicitly studied.
Questions/purposes:
We evaluated the effect of TMR on residual limb neuroma pain in upper-extremity amputees.

Methods: We conducted a retrospective medical record review of all 28 patients treated with TMR from 2002 to 2012 at Northwestern Memorial Hospital/Rehabilitation Institute of Chicago (Chicago, IL, USA) and San Antonio Military Medical Center (San Antonio, TX, USA). Twenty-six of 28 patients had sufficient (> 6 months) follow-up for study inclusion. The amputation levels were shoulder disarticulation (10 patients) and transhumeral (16 patients). All patients underwent TMR for the primary purpose of improved myoelectric control. Of the 26 patients included in the study, 15 patients had evidence of postamputation neuroma pain before undergoing TMR.

Results: Of the 15 patients presenting with neuroma pain before TMR, 14 experienced complete resolution of pain in the transferred nerves, and the remaining patient's pain improved (though did not resolve). None of the patients who presented without evidence of postamputation neuroma pain developed neuroma pain after the TMR procedure. All 26 patients were fitted with a prosthesis, and 23 of the 26 patients were able to operate a TMR-controlled prosthesis.

Conclusions: 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.

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