A COMPARISON OF TWO INTERCOSTAL NERVE TRANSFER RECIPIENTS: THE MOTOR BRANCH OF THE BICEPS AND THE MUSCULOCUTANEOUS NERVE PROPER

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Introduction

Intercostal nerve (ICN) to musculocutaneous nerve (MCN) transfer has inferior results compared to both Oberlin's transfer and double fascicular transfer. These poorer outcomes have previously been attributed in part to the low donor to recipient motor axon ratio. One way described technique to overcome this shortcoming is to transfer the ICNs directly to the motor branch of the biceps. We hypothesize that ICN-MCN transfer directly to the motor branch of the biceps (MBB) produces superior elbow flexion strength compared to transferring the ICN to the MCN proper.

Methods

A systematic review of the literature was conducted by two independent reviewers according to PRISMA guidelines. Inclusion criteria were studies reporting individual patient demographics and outcomes (age, time from injury to surgery, extent of injury, number of ICNs transferred, elbow flexion MRC scores, follow-up time). Patients were excluded for the following reasons: follow-up <1 year, use of nerve grafting in ICN transfer, and any procedure for enhancement of elbow flexion other than ICN to MCN transfer. The primary outcome collected was elbow flexion Medical Research Council (MRC) score attained at final follow-up visit. Secondary outcomes were % of patients achieving MRC≥3/MRC≥4.

Results

There were 43 patients from 6 studies included in this pooled analysis. There were 20 patients in the MCN proper transfer group and 23 patients in the MBB transfer group. All nerve transfers utilized 2 ICNs as donors. The MCN proper group had significantly longer follow-up times (MCN 63.5 months [SD: 25.0], MBB 32.6 [SD:12.5]; p=0.003). There were no other significant demographic differences between the two groups. There was no difference between the MCN and MBB transfer groups in mean MRC score (MCN 3.3 [SD:1.0], MBB 2.9 [SD:1.5]; p=0.334), ability to achieve MRC≥3 (MCN 80.0%, MBB 78.2%; p=0.889), ability to achieve MRC≥4 (MCN 55.0%, MBB 43.5%, p=0.568).

Table 1. A Comparison in Demographics Between Oberlin's Transfer and ICN Transfer Group

	MCN proper (20)	MBB (23)	P value
Follow-up, months, mean (SD)	63.4 (25.0)	32.6 (12.5)	.003
MRC score, mean (SD)	3.3 (1.0)	2.9 (1.5)	0.334
Ability to achieve MRC ≥ 3	80.0%	78.2%	0.889
Ability to achieve MRC ≥ 4	55.0%	43.5%	0.568

Conclusions

In this pooled analysis, we found no evidence of any benefit derived from intercostal nerve transfer directly to MBB instead of the MCN proper.