

# Brachial Plexus Injury Treatment

Treatment options that include [neurolysis](#), [nerve grafting](#), or [neurotization](#) ([nerve transfer](#)) has become an important procedure in the [restoration](#) of function in patients with irreparable preganglionic lesions. Restoration of [elbow flexion](#) is the primary goal in treating patients with severe [brachial plexus injury](#). Nerve transfers are used when [spinal roots](#) are avulsed, and proximal stumps are not available.

[Nerve transfers](#) using [ulnar nerve](#) and/or [median nerve](#) fascicles to restore elbow flexion have been widely used following traumatic brachial plexus injury, but their utility following [neonatal brachial plexus palsy](#) remains unclear.

## Brachial Plexus Reconstruction

Free functioning [muscle transfer](#) is a reconstructive option to restore [elbow flexion](#) in [brachial plexus injury](#). Hinchcliff et al. determined the impact of body mass index, age, and location of distal tendon attachment on elbow flexion strength after free functioning muscle transfer in [traumatic brachial plexus injury](#) patients.

**Methods:** A retrospective review of patients who underwent free functioning muscle transfer for elbow flexion as part of their brachial plexus injury reconstruction with a minimum 2-year follow-up were evaluated. Outcomes assessed included elbow flexion strength (British Medical Research Council grade) and change in Disabilities of the Arm, Shoulder and Hand questionnaire and visual analogue scale pain scores.

**Results:** One hundred six patients met inclusion criteria. The average age was 32 years, and the average body mass index was 27.1 kg/m<sup>2</sup>; 56.5 percent of patients achieved M3 or greater muscle grade using the authors' strict modification of the British Medical Research Council scale. Disabilities of the Arm, Shoulder and Hand questionnaire scores improved from 45.7 to 38.8 ( $p < 0.05$ ). Visual analogue scale pain scores decreased, but this trend did not obtain significance. Age and body mass index both had a significant negative impact on final free functioning muscle transfer grade ( $p < 0.05$ ). Use of a distal tendon insertion led to improved muscle grade outcomes, with targeting of wrist extension being superior to finger flexion ( $p < 0.05$ ). Simultaneous musculocutaneous nerve grafting did not significantly alter final elbow flexion strength.

Increasing [age](#) and [body mass index](#) both imparted a deleterious effect on free functioning muscle transfer muscle grade. Distal muscle targets had better strength outcomes than when the biceps tendon was used <sup>1)</sup>.

<sup>1)</sup>

Hinchcliff KM, Kircher MF, Bishop AT, Spinner RJ, Shin AY. Factors Impacting the Success of Free Functioning Gracilis Muscle Transfer for Elbow Flexion in Brachial Plexus Reconstruction. *Plast Reconstr Surg*. 2022 Mar 11. doi: 10.1097/PRS.0000000000009036. Epub ahead of print. PMID: 35271536.

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