

Gracilis Free Flap Technique for Elbow Flexion Reconstruction

Gerardo Sanchez-Navarro, Dylan T Lowe, Jacques Henri Hacquebord, Nikhil Amman Agrawal

Background:

Brachial Plexus injuries (BPI) can be devastating for patients, often resulting in notable physical, psychological, and socioeconomic distress¹. Violent accidents that torque the head away from the shoulder damage the upper brachial plexus roots with varying severity to the lower roots¹. Patients suffering pan-plexus injuries typically present with a flail extremity with loss of sensory function and generalized atrophy. Therefore, to improve activities of daily living, the treatment for pan-plexus injuries focuses on restoring antigravity motion of the upper extremity, with elbow flexion being the highest priority muscle group. Nerve transfers are an excellent option; however, this path is not always viable. To this end, free-functioning muscle transfers, especially Gracilis, are a primary reconstructive approach that has shown excellent outcomes in complete BPI lesions.

Purpose:

In this technique video, we present the exploration of a complex BPI where the creation of a gracilis-free flap is executed for elbow flexion reconstruction. This video provides a comprehensive guide from markings, flap elevation, microsurgical technique, and inset with educational operative pearls at every step.

Methods:

The anatomy, examination, diagnosis, and treatment options for patients suffering pan-plexus injuries. We present a case of a 30-year-old male with a left pan-plexus injury after a motorcycle accident. The patient exhibited a complete loss of the left upper extremity function and sensation with evident generalized extremity atrophy and a reported pseudomeningocele of the postganglionic segment. Given his clinical picture, he was indicated for brachial plexus exploration with the creation of a lower extremity myocutaneous free flap.

Results:

The post-operative clinical outcome showed well-healed incisions, and the patient reported doing well without wound dehiscence, drainage, or dehiscence. Furthermore, the patient is expected to progress to volitional control.

Conclusion:

Gracilis Free Flap Technique is a viable surgical option for elbow flexion reconstruction in patients with pan-plexus injuries. Appropriate patient selection and adherence to post-operative rehabilitation are crucial for optimal outcomes.