

A Surgical Technique to Improve Shoulder External Rotation in Upper Brachial Plexus (C5-C6) Injuries by Selective Nerve Transfers



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Introduction

- In C5-C6 Brachial Plexus (BP) injuries, restoration of elbow flexion, shoulder abduction and external is required.
- When proximal root stumps are not available for nerve grafting, or when the time from the injury won't allow a brachial plexus primary reconstruction.
- Functional loss can be re establish through nerve transfers if the timing from the injury is suitable.

Objectives

- The authors describe a surgical technique through an axillar approach for the reconstruction of shoulder function in upper brachial plexus injuries.
- By **selectively** neurotizing the **teres minor** and the **anterior axillary nerve branches** to improve shoulder external rotation.

Methods

- 10 patients with C5-C6 BP injuries were treated with nerve transfers using this technique.
- Spinal accessory nerve (SAN) to supraescapular nerve (SSN) transfer and double Oberlin procedure was done to restore shoulder and elbow function.
- To improve shoulder function, a second nerve transfer for the shoulder was performed.
- Through an **axillary approach**
- The long head of the triceps nerve branch if followed distally until a terminal nerve division was obtained before the nerve enters into the triceps muscle. (Figure I)
- This branch and its terminal divisions were used to selective neurotize the anterior branch of the axillary nerve and the nerve to the teres minor muscle. (Figure II)

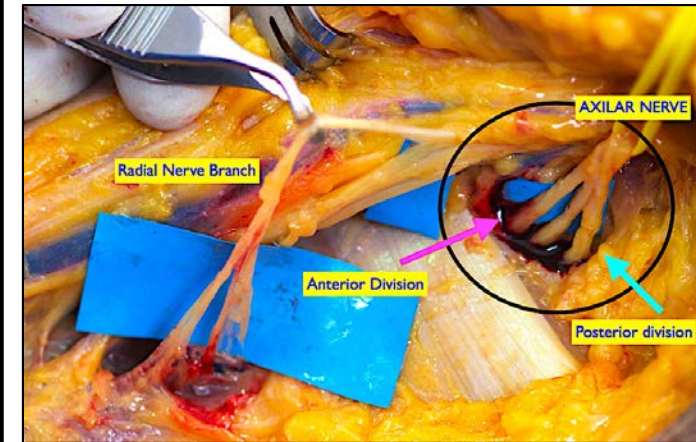


Figure I Radial nerve branch for long head of the triceps and its distal bifurcation. Axillary nerve showing the anterior, middle and posterior division.

Figure II Selective neurotization to the anterior motor branch of the axillary nerve for the deltoid muscle and posterior axillary branch to teres minor muscle.



Results

- All patients obtain a muscle grading strength of M4 or more of shoulder external rotation in adduction and 90 degrees shoulder abduction. (Figure III)

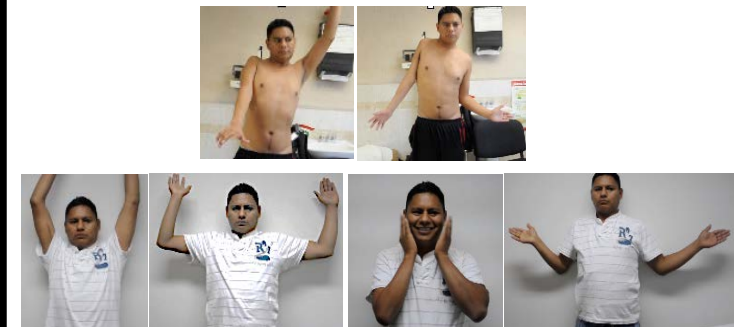


Figure III Restoration of shoulder abduction, external rotation in adduction and abduction, and elbow flexion.

Conclusions

- This technique has the **advantage** of neurotizing the anterior motor component of the axillary nerve and teres minor without any axon loss in the sensory or articular distribution through an axillary approach.
- **Shoulder external rotation** outcomes are improved either in shoulder **adduction and abduction**.