

Deltopectoral Approach Overcomes All Blind Spots for Axillary Nerve Transfers in Brachial Plexus Injuries and Isolated Axillary Nerve Injuries

J. Terrence Jose Jerome¹

¹Department of Orthopedics, Hand, and Reconstructive Microsurgery, Olympia Hospital and Research Centre, Trichy, Tamil Nadu, India

Address for correspondence J. Terrence Jose Jerome, MBBS, FRCS, DNB, MNAMS, FNB (Hand & Microsurgery), FICS, PGDMLE, Department of Orthopedics, Hand, and Reconstructive Microsurgery, Olympia Hospital and Research Centre, 47A Puthur High Road, Trichy - 620017, Tamil Nadu, India (e-mail: terrencejose@gmail.com).

J Hand Microsurg 2021;13:121–122.

Kline and Kim described the following four categories of axillary nerve (AN) injuries: solitary AN palsy, AN palsy associated with suprascapular nerve palsy, AN and posterior cord palsy, and AN injuries with other brachial plexus lesions.¹ The axillary nerve is vulnerable to injuries around the shoulder and traction lesions. Although spontaneous recovery is expected in many patients, reconstruction is sometimes required. The functional outcome of axillary nerve reconstruction is relatively good because of the anatomical characteristics, relatively simple function, and the short distance between injury and target muscle.²

Jerome had noted isolated axillary nerve avulsion from the posterior cord and found the anterior deltopectoral approach helpful in identifying it.² The approach also helped to completely excise the 13 cm neuroma from the posterior cord to the quadrangular space, and nerve to brachialis was transferred to the axillary nerve. The author divided the pectoralis muscles and sutured them back. Recovery and functional outcome were full in their follow-up with no shoulder morbidity.

Pérez et al evaluated the feasibility of exploring the AN in a cadaver at the 6 o'clock position (blind spot), using the deltopectoral approach, with the interval lateral to the conjoint tendon (CJT) or combined with the axillary approach.³ Further, they recommended a combination of deltopectoral approach, medial or lateral to CJT, and axillary approach exposing 81 to 94% of the total length of the AN.

Jerome and Perez et al reported difficulty accessing the proximal portion of the AN as a disadvantage in the axillary and posterior approach.^{2,3} Jerome retracted the CJT to have direct and easy exposure of AN through his deltopectoral approach, in order to avoid the blind spot.⁴ For better visualization in obese patients and certain tough conditions, they cut pectoralis muscles and sutured them back with no

morbidity. The lateral cord and the axillary artery are swept medially to access the posterior cord and the AN. The AN is located high in the axilla, posterior to the axillary artery, lateral to the radial nerve, and anterior to the subscapularis. The long head of the triceps branch (first branch of the radial nerve) is posterior and medial to the radial nerve at this region. These three nerves course more or less parallel in their exit at this level of approach. In this region, the AN is lateral, the radial nerve is in the middle, and the long head of the triceps branch is medial. Thus, the deltopectoral approach provides straightforward access for long head of triceps branch transfer to the AN.⁴

Jerome reported the deltopectoral approach as an open window for AN repair or transfers.⁵ All other potential donors such as medial pectoral nerve, thoracodorsal nerve, and median and ulnar nerve fascicles were easily accessed.⁶ Through the same approach, medial pectoral and thoracodorsal transfer to AN produced good shoulder abduction and functional outcome in their series.⁵

The cadaveric dissection of different surgical approaches to the AN may not simulate the real-time injuries happening to patients. The AN injuries may be associated with fractures, shoulder dislocations, arthroscopic procedures, and other interventions around the shoulder with a definite and different pattern of injuries. Combining the deltopectoral approach (medial or later to the conjoint tendon) and axillary approach for a single entity to avoid the blind spot may not be appropriate and pragmatic.^{2,4-6} The AN injury may range from an isolated complete avulsion from the posterior cord to association with other cord or plexus injuries, for which deltopectoral conjoint tendon splitting or retracting approach seems better and very useful.²

Conflict of Interest

None declared.

published online
July 7, 2021

© 2021. Society of Indian Hand & Microsurgeons. All rights reserved.
Thieme Medical and Scientific
Publishers Pvt. Ltd., A-12, 2nd Floor,
Sector 2, Noida-201301 UP, India

DOI <https://doi.org/10.1055/s-0041-1732769>
ISSN 0974-3227

References

- 1 Kline DG, Kim DH. Axillary nerve repair in 99 patients with 101 stretch injuries. *J Neurosurg* 2003;99(4):630–636
- 2 Jose Jerome JT. Nerve to brachialis transfer to axillary nerve. *J Hand Surg Eur Vol* 2012;37(5):469–470
- 3 Pérez A, Mahmood B, Jethanandani R, Lee SK, Wolfe SW. Overcoming the axillary nerve blind spot through the deltopectoral and axillary approaches: a cadaveric study. *J Hand Surg Am* 2020;45(7):659.e1–659.e7
- 4 Jerome JT. Anterior deltopectoral approach for axillary nerve neurotisation. *J Orthop Surg (Hong Kong)* 2012;20(1):66–70
- 5 Jerome JT, Rajmohan B. Axillary nerve neurotization with the anterior deltopectoral approach in brachial plexus injuries. *Microsurgery* 2012;32(6):445–451
- 6 Jerome JT. Long head of the triceps branch transfer to axillary nerve in C5, C6 brachial plexus injuries: anterior approach. *Plast Reconstr Surg* 2011;128(3):740–741