

Costoclavicular block – single to double injection – time to see the premiere of triple injection



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Sir,

Securing the phrenic nerve when achieving effective anesthesia block for the upper limb has been a topic intriguing regional anesthesia enthusiasts ever since. Interscalene brachial plexus block is known to involve the phrenic nerve in 100% of the cases and costoclavicular block which has gained momentum since 2015 is declared to involve the phrenic nerve in 0% of the cases.¹ Besides this the compact, reliable topography of the cords in the triangular costoclavicular space along with an expedited sensorimotor block with local anesthesia deposited in the center of the three cords makes costoclavicular block an attractive option for elbow and below elbow surgeries.^{1,2} According to the studies, the success rate of the blockade is 92.5% with single injection in the center of the cords.² Another study by Sebastian, where apart from classical single injection, another injection was given after redirecting the needle, between the medial cord and subclavian artery (labeling it a corner pocket technique) for costoclavicular block.³ They concluded that the block's onset time and total anesthesia-related time were significantly shortened with the double injection technique compared with single injection. The basis of this was explanation laid by Dr. Monzo and Hadzic where they proposed in a series of 40 patients a linear septum arising from the lateral part of axillary artery separating the lateral cord from the posterior and the medial cord, thus compartmentalizing the costoclavicular space.⁴ They reported a success rate of 97.5% in their study on 40 patients.⁴ Hence, double injection is used to overcome the septum "issue."

Pornpatra is defined a high definition ultrasonographic presence of paraneural sheath and facial compartments surrounding the brachial plexus cords at the lateral infraclavicular fossa and the costoclavicular space.⁵ We propose that a triple injection with 3rd injection in the vicinity of the lateral cord just before withdrawing the needle apart from the other two injections significantly shortens the onset time of sensory block from 16 min³ to 9 min (Figure 1). The various sites for injection are shown in the figure below, but the exact point of injection of

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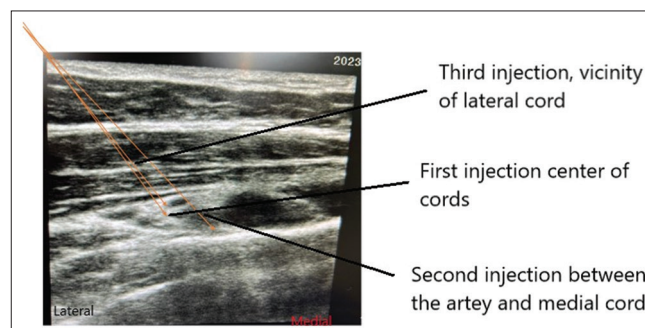


Figure 1: Site of three injections for costoclavicular block

the second and third is more prominent after giving the first injection. The chances of the median nerve sparing as has been reported in some cases in previous studies are almost nil by this technique - the corner pocket injection that involves the medial root of the median nerve and the lateral cord that is specifically blocked separately covering the lateral root of the median nerve.

CONCLUSION

We did a case series in 15 cases and although the sample size is small and this is definitely not a randomized control trial, to make such a bold statement, we would like to decipher

a positive future of the costoclavicular block with triple injection technique with an RCT already underway.

AVAILABILITY OF DATA

Our data, including raw dataset, are available upon request from the corresponding author.

Key words: Costoclavicular block; Triple injection; Cords

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REFERENCES

1. Karmakar MK, Sala-Blanch X, Songthamwat B and Tsui BC. Benefits of the costoclavicular space for ultrasound-

guided infraclavicular brachial plexus block: Description of a costoclavicular approach. *Reg Anesth Pain Med.* 2015;40(3):287-288.

<https://doi.org/10.1097/AAP.0000000000000232>

2. Li JW, Songthamwat B, Samy W, Sala-Blanch X and Karmakar MK. Ultrasound-guided costoclavicular brachial plexus block: Sonoanatomy, technique, and block dynamics. *Reg Anesth Pain Med.* 2017;42(2):233-240.

<https://doi.org/10.1097/AAP.0000000000000566>

3. Layera S, Aliste J, Bravo D, Fernández D, García A, Finlayson RJ, et al. Single-versus double-injection costoclavicular block: A randomized comparison. *Reg Anesth Pain Med.* 2020;45(3):209-213.

<https://doi.org/10.1136/rapm-2019-101167>

4. Monzó E and Hadzic A Costoclavicular approach to the brachial plexus block: Simple or double injection? *Reg Anesth Pain Med.* 2019;2019:100852.

<https://doi.org/10.1136/rapm-2019-100852>

5. Areeruk P, Karmakar MK, Reina MA, Mok LY, Sivakumar RK and Sala-Blanch X. High-definition ultrasound imaging defines the paraneural sheath and fascial compartments surrounding the cords of the brachial plexus at the costoclavicular space and lateral infraclavicular fossa. *Reg Anesth Pain Med.* 2021;46(6):500-506.

<https://doi.org/10.1136/rapm-2020-102304>

Authors' Contributions:

PB- Designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript; **NS, PB**- Managed the analyses of the study; **PB**- Managed the literature searches.

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