



Case report

Regional anesthesia as a safe anesthesia technique for clavicle surgery in a COVID-19 positive patient at rural setup: A case report

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ABSTRACT

Introduction: Clavicle fractures are less commonly managed under regional anesthesia compared to general anesthesia. The study highlights the advantage of regional anesthesia in reducing the risk of aerosol generation and viral transmission during the times of COVID-19 and avoiding the complications associated with general anesthesia.

Presentation of case: We report a case of 42 years old COVID-19 positive male with a left clavicle fracture due to a fall from a tree, who was managed under regional anesthesia with open reduction and internal fixation. A combination of interscalene brachial plexus and superficial cervical plexus block was performed.

Discussion: The dual innervation of the clavicle makes combined interscalene brachial plexus and superficial cervical plexus block an effective method of anesthesia for clavicle surgery. It provides better analgesia, has fewer postoperative complications, less infection transmission via aerosol, and earlier hospital discharge as compared to general anesthesia.

Conclusion: Ultrasound-guided combined interscalene brachial plexus and superficial cervical plexus block can be used as a safe anesthetic technique in clavicle surgery.

1. Introduction

Clavicle fractures are usually operated under general anesthesia and less commonly with regional anesthesia in rural setups. General anesthesia, which usually involves airway manipulation has an increased risk of aerosol generation and transmission of the virus during the times of COVID-19 pandemic [1]. Regional anesthesia on the other hand provides the advantage of the decrease in aerosol-generating procedures, better postoperative analgesia, fewer postoperative complications, and early discharge rate [2]. Although ultrasound-guided regional anesthesia is gaining popularity, especially in higher centers, its use in remote health care centers is very few due to limited resources.

Herein, we report a case of a 42 years old COVID-19 positive male, who sustained a fracture of the left clavicle following a fall from a tree and was managed under regional anesthesia with open reduction and internal fixation. The study shows that regional anesthesia can be a safe

alternative in the management of clavicle fracture, especially during the COVID-19 pandemic and in rural setup. The case report has been reported in line with the SCARE criteria [3].

2. Presentation of case

A 42 years old male patient sustained a fall from a tree and presented to the emergency service of the Trishuli hospital with a painful left shoulder. He had no other comorbidities, no significant medical and psychosocial history. There was no significant past history but he was a chronic alcoholic, consumed 2 glasses of alcohol daily for 20 years. The patient had no previous history of surgery, drug usage, or allergy. Plain X-ray showed a comminuted displaced fracture of the middle third of the left clavicle (Fig. 1). Consultation with the department of orthopedics and trauma surgery was done. After evaluation, open reduction and internal fixation was planned.

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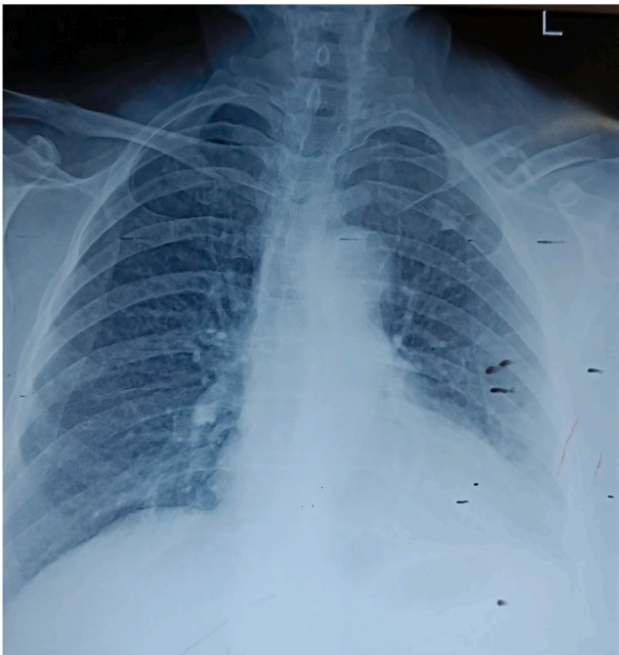


Fig. 1. Plain X-ray showing left clavicle fracture.

During the preoperative investigation, he was found COVID-19 positive although he was asymptomatic. A peripheral nerve block was planned to avoid airway manipulation during general anesthesia. As he was a chronic alcoholic, to avoid the side effects of drugs used in general anesthesia and the risk of alcohol withdrawal during the postoperative period, regional anesthesia was a better choice.

In the operating room, monitoring was done with an electrocardiogram, oxygen saturation, and noninvasive blood pressure measurement. After intravenous access, 0.9% sodium chloride was infused intravenously. With informed consent, an ultrasound-guided block was performed. The patient was placed in a supine position and head turned to the contralateral side. Then left side of the neck was cleaned with povidone-iodine. Under all aseptic conditions, a linear transducer was placed at the level of thyroid cartilage at the posterior border of the sternocleidomastoid muscle. Then superficial cervical plexus block was carried out. A mixture of 10 ml of 0.25% bupivacaine (2.5 mg) and 1% lignocaine (10 mg) was injected into the superficial cervical fascia with a 25 gauge needle.

Then interscalene brachial plexus block was performed. 20 ml of a mixture of 0.25% bupivacaine (5 mg) with 1% lignocaine (10 mg) was administered after identifying interscalene brachial plexus. Our patient received the safe dose of the drug as the safe dose for bupivacaine is 2.5 mg/kg and for lignocaine without adrenaline is 5 mg/kg. Sensory block was assessed. The procedure lasted for nearly 2 h during which no significant variation in heart rate and blood pressure was noted. The patient was awake and did not experience any pain. There was no need for additional analgesics and sedatives during the entire surgery. Hoarseness of voice was noted, probably due to recurrent laryngeal nerve injury, but the patient recovered later by the end of surgery. No complications such as Horner's syndrome and phrenic nerve palsy were observed during the procedure. The clavicle fracture was managed with open reduction and internal fixation (Fig. 2). He had no complications after surgery and was discharged home (Fig. 3).

3. Discussion

The clavicle has a dual nerve supply from the brachial plexus and cervical plexus, thus a combination of superficial cervical plexus block and interscalene brachial plexus block can provide complete anesthesia



Fig. 2. Clavicle fracture managed with open reduction and internal fixation after regional anesthesia.



Fig. 3. Patient after completion of the surgery.

in this region [4]. So, utilizing the facility of ultrasound availability, regional anesthesia was chosen for the patient with asymptomatic COVID-19 positive status to avoid the risk of airway manipulation and aerosol generation and transmission of the virus.

Previously in clavicle surgery, regional anesthesia was used for analgesic purposes in the post-operative period rather than the sole mode of anesthesia. This case demonstrates that a combination of superficial cervical plexus block and interscalene brachial plexus block can be used as a sole mode of anesthesia in clavicle surgery. The combination of these two blocks not only provides the advantage of good analgesia during the intraoperative and postoperative periods but also avoids the risk of airway manipulation and aerosol generation during the pandemic period [2]. This technique of anesthesia also reduces the side effects of drugs used in general anesthesia and attenuates the need for additional analgesics postoperatively [5]. These advantages of regional anesthesia in clavicle surgery can act as a boon in rural areas with limited resources.

KC KK et al. reported a case series of three cases under ultrasound-guided combined interscalene and superficial cervical plexus block and found optimal patient comfort and no need for additional analgesia

[6]. Similarly, another case report from Kathmandu Medical college demonstrated two cases of clavicular surgery with combined interscalene and superficial cervical plexus block under ultrasound guidance with the use of ropivacaine and dexmedetomidine and found regional anesthesia to be comfortable to the patients and there was no need for additional analgesics [5]. A study by Pal AA et al. also showed successful management of a case of acromial clavicular disruption with ultrasound-guided interscalene and superficial cervical plexus block [7]. A case series of 12 patients showed that ultrasound-guided combined interscalene and cervical plexus block for clavicular fracture was a successful and effective method of anesthesia with no acute complications [8]. In a retrospective review of 110 patients with a clavicle fracture, where 52 received regional anesthesia with combined block and 58 received general anesthesia with an interscalene brachial plexus block, regional anesthesia using the combined technique was associated with shorter anesthesia start time and less need for intraoperative analgesics [9].

The possible complications are Horner's syndrome (due to the involvement of the cervical sympathetic chain), phrenic nerve palsy, and recurrent nerve palsy. These complications might look scary to the patients but are self-limiting and can be avoided by being familiar with the anatomical landmarks of the nerve plexus and using appropriate anesthetic volumes at a shallow depth [10]. The use of ultrasound can further minimize the complications by localizing the area to be blocked and also avoiding injury to the vessels [11]. Therefore, ultrasound-guided combined interscalene brachial plexus and superficial cervical plexus block can be used as a safe anesthetic technique in clavicle surgery.

4. Conclusion

A combination of interscalene and superficial cervical plexus block can be used as the sole anesthetic technique in clavicle surgery, especially in conditions where avoidance of general anesthesia comes with greater benefits. It not only decreases the risk of aerosol generation and viral transmission but also avoids the complications of general anesthesia in rural areas with a limited setup. In addition, the availability of ultrasound helps to provide safe and effective anesthesia with better visualization of structures in the minimal amount of dose.

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Ethical approval

Not applicable.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in Chief of this journal on request.

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CRediT authorship contribution statement

Author 1: Concept of study, case data collection, revising, and editing the manuscript.

Author 2: Literature review, revising, and editing the manuscript.

Author 3: Literature review, revising, and editing the manuscript.

Author 4: Literature review, concept of the study, revising, and editing the manuscript.

Author 5: Contributed to writing the manuscript draft, revising, and editing the manuscript.

Author 6: Literature review, revising, and editing the rough draft into a final manuscript.

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Declaration of competing interest

None.

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References

- [1] Infection prevention and control of epidemic-and pandemic-prone acute respiratory diseases in health care WHO Interim Guidelines (n.d.), <http://www.who.int/csr/sars/infectioncontrol/en/>, 2007. (Accessed 11 December 2021).
- [2] A.J.R. Macfarlane, W. Harrop-Griffiths, A. Pawa, Regional anaesthesia and COVID-19: first choice at last? *Br. J. Anaesth.* 125 (2020) 243–247, <https://doi.org/10.1016/j.bja.2020.05.016>.
- [3] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, A. Thoma, A.J. Beamish, A. Noureldin, A. Rao, B. Vasudevan, B. Challacombe, B. Perakath, B. Kirshtein, B. Ekser, C.S. Pramesh, D.M. Laskin, D. Machado-Aranda, D. Miguel, D. Pagano, F. H. Millham, G. Roy, H. Kadioglu, I.J. Nixon, I. Mukhejee, J.A. McCaul, J. Chi-Yong Ngu, J. Albrecht, J.G. Rivas, K. Raveendran, L. Derbyshire, M.H. Ather, M. A. Thorat, M. Valmasoni, M. Bashashati, M. Chalkoo, N.Z. Teo, N. Raison, O. J. Muensterer, P.J. Bradley, P. Goel, P.S. Pai, R.Y. Afifi, R.D. Rosin, R. Coppola, R. Klappenbach, R. Wynn, R.L. De Wilde, S. Surani, S. Giordano, S. Massarut, S. G. Raja, S. Basu, S.A. Enam, T.G. Manning, T. Cross, V.K. Karanth, V. Kasisvnanathan, Z. Mei, The SCARE 2020 guideline: updating consensus Surgical CAsE REport (SCARE) guidelines, *Int. J. Surg.* 84 (2020) 226–230, <https://doi.org/10.1016/j.ijsu.2020.10.034>.
- [4] View of Ultrasound guided superficial cervical plexus and interscalene brachial plexus block for clavicular surgery (n.d.), <https://www.apicareonline.com/index.php/APIC/article/view/188/182>. (Accessed 11 December 2021).
- [5] View of regional anaesthesia in clavicle surgery (n.d.), <https://www.jnma.com.np/jnma/index.php/jnma/article/view/3152/2637>. (Accessed 11 December 2021).
- [6] View of combined interscalene and superficial cervical plexus block for clavicle surgery: case series (n.d.), <https://nmj.com.np/nmj/index.php/nmj/article/view/28/27>. (Accessed 11 December 2021).
- [7] A.A. Paul, R. Ranjan, S.K. George, S.M. Suranigi, Ultrasound guided superficial cervical plexus and superior trunk interscalene block as sole anaesthetic technique for acromioclavicular joint fixation surgery, *J. Clin. Diagnostic Res.* (2019) 1–2, <https://doi.org/10.7860/jcdr/2019/41029.12792>.
- [8] O. Balaban, T.C. Dülgeroğlu, T. Aydin, Ultrasound-guided combined interscalene-cervical plexus block for surgical anesthesia in clavicular fractures: a retrospective observational study, *Anesthesiol. Res. Pract.* 2018 (2018), <https://doi.org/10.1155/2018/7842128>.
- [9] D.J. Ryan, N. Iofin, D. Furgiuele, J. Johnson, K. Ego, Regional anesthesia for clavicle fracture surgery is safe and effective, *J. Shoulder Elb. Surg.* 30 (2021) e356–e360, <https://doi.org/10.1016/j.jse.2020.10.009>.
- [10] S. Flores, C. Riguzzi, A.A. Herring, A. Nagdev, Horner's syndrome after superficial cervical plexus block, *West J. Emerg. Med.* 16 (2015) 428–431, <https://doi.org/10.5811/WESTJEM.2015.2.25336>.
- [11] H. Shanthanna, Ultrasound guided selective cervical nerve root block and superficial cervical plexus block for surgeries on the clavicle, *Indian J. Anaesth.* 58 (2014) 327, <https://doi.org/10.4103/0019-5049.135050>.