

Ultrasound-Guided Clavipectoral Plane Block Is a Safe and Excellent Perioperative Analgesic Option for a Complex Patient for Clavicle Surgery: A Case Report

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Abstract

Clavipectoral Fascial Plane Block (CPB) is an attractive method of providing perioperative analgesia in patients with fractured clavicles. It is safe, easy to perform, and provides satisfactory analgesia with minimum complication risk. This report describes CPB in a 67-year-old woman with multiple comorbidities who underwent successful clavicle fracture fixation either as a stand-alone anaesthetic technique or combined with general anaesthesia. Correctly performed CPB could effectively reduce perioperative analgesic use, particularly in patients unsuitable for commonly used analgesics, while providing adequate analgesia for a prolonged duration.

Keywords: Fracture clavicle • Ultrasound-guided block • Clavipectoral fascia block • Analgesia

Introduction

Clavicular fracture is a common injury and consists of up to 10% of all fractures [1]. Most fracture clavicles are managed conservatively, except for comminuted fractures or those with severe dislocation, where surgical fixation remains the only option. We report the perioperative management of a 67-year-old woman who presented to the Emergency Department (ED) with a compound right clavicle fracture. She had multiple comorbid conditions and was allergic to commonly used analgesics.

Case Report

A 67-year-old female patient (body weight 68 Kg and BMI 27.3) with known diabetes, ulcerative colitis and anxiety disorder presented with a history of falls from a horse, after which she had severe pain (9-10/10) on a numeric rating scale (NRS) and swelling in the right clavicular area. She had no other injury and was fully conscious and oriented. Her Initial X-ray of the right shoulder area revealed a right-sided, complete, displaced fracture clavicle (Figure 1). Her pain was managed in the ED with intravenous paracetamol and morphine patient-controlled analgesia (PCA). However, she developed severe nausea, vomiting, and abdominal distension with these analgesics. Also, she became very drowsy with morphine PCA and developed respiratory depression, which was managed with naloxone. Meanwhile, she was reviewed by the orthopaedic

team and planned for open reduction and internal fixation (ORIF with plate and screw) as it was a complete and displaced fracture.

Considering her severe pain from the fractured clavicle and medical condition (Ulcerative Colitis), she was not a suitable candidate for nonsteroidal anti-inflammatory drugs (NSAIDs). Moreover, she developed complications due to opioids. Therefore, as an alternative plan for postoperative analgesia, we explained to her the role of ultrasound-guided Clavipectoral Fascial Plane Block (CPB). We told her about the benefits and risks of CPB, and after considering those, she agreed to the block. Block was performed in the ED before transferring the patient to the operation theatre, and 15 minutes after the block, her pain score was 0/10. After she was transferred to the operating room, general anaesthesia was induced (because of her severe anxiety) with propofol and fentanyl (a total of 50 micrograms during the procedure), and the airway was managed with a supraglottic airway (i-gel no 4). Anaesthesia was maintained with air: oxygen 35:65 and sevoflurane with MAC 1.1 with spontaneous ventilation. Levobupivacaine 0.25%, 20ml was injected at the skin incision site by the surgeon at the end of the procedure. No other analgesia was given during the entire procedure. The i-gel was taken out in the postoperative recovery room, where she woke up without pain. She was observed 30 minutes in the recovery, and her pain score remained (before discharge to the ward) 0/10. We prescribed regular paracetamol 1000mg six hourly and codeine 30mg as needed, and laxative and ondansetron. A pain nurse in the ward observed her, and her pain score for the initial 12 hours was 0/10 (both static and dynamic). She was discharged home 16 hours after the procedure, and before discharge, her pain score was 01/10 (static) and 3/10

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Figure 1: X-ray of the right shoulder area revealed a right-sided, complete, displaced fracture clavicle.

(dynamic), respectively. On routine postoperative discharge phone follow-up, she reported 10/10 satisfaction with the perioperative regional analgesia plan.

Clavipectoral Fascial Plane Block (CPB)

The main aim of ultrasound-guided CPB is the deposition of local anaesthesia under the fascial covering so that all the distal nerve-supplying clavicles can be blocked. In a displaced fracture, there is a possible breach of CPB; therefore, it is essential to inject both the medial and lateral sides of the fracture [2].

The block was performed preoperatively in the emergency room with minimal sedation (midazolam 1mg intravenous) because the patient was in severe pain and she could not tolerate the standard analgesic regime. Standard monitoring (blood pressure measurement every three minutes, continuous electrocardiogram, and pulse oximetry) was applied, and equipment for resuscitation was kept on standby. The procedure was explained to the patient, and the site was confirmed. Right CPB was performed supine, with the head turned towards the opposite side (left). Under aseptic precautions, a high-frequency linear probe (Sonosite HFL38x/13-6MHz; Fujifilm SonoSite, Bothell, WA) was placed in the craniocaudal direction on the anterior surface of the right clavicle 2 cm away (horizontally) from the fracture line (Figure 2). A-80-mm Pujunk needle ultrasound-visible stimulation was advanced in a caudad to cranial direction using an in-plane technique until it reached the clavipectoral fascia (Figure 3). After negative aspiration, 15 ml of 0.375% bupivacaine with adrenaline was injected on either side of the fracture. The spread of local anaesthetic solution was visualised between the clavipectoral fascia and the periosteum.

Discussion

The nerve supply of the clavicle is complex; it receives its supply from both the cervical and brachial plexus [3]. The superior surface, including the sternoclavicular and acromioclavicular joint, receives supply from the supraclavicular nerve (C3,4) branch of the cervical plexus. The inferior surface in the middle and medial one-third is supplied by the subclavian nerve (C5,6), and the middle and lateral one-third is supplied by the lateral pectoral nerve (C5,7). The lateral pectoral nerve also supplies the inferior surface of the acromioclavicular joint [4]. Clavicles also receive contributions from the long thoracic nerve (C5,7), Accessory Nerve (CN11) and suprascapular nerve (C5,6). Distal branches of all the above nerves pierce the clavipectoral fascia and supply the clavicle (Figure 4) [5].

Various regional analgesia methods tried for better perioperative analgesia for clavicular fixations are interscalene block (ISB) [6], the combination of ISB and superficial cervical plexus block (SCPB) [7]. Even ultrasound-guided ISB and SCPB might cause complications, e.g., phrenic nerve palsy, motor blockade of upper extremities, and Horner's syndrome. In rare instances, more severe events like pneumothorax or intrathecal injection of local anaesthetics or damage to vertebral artery might occur [8]. Ultrasound-guided CPB is a

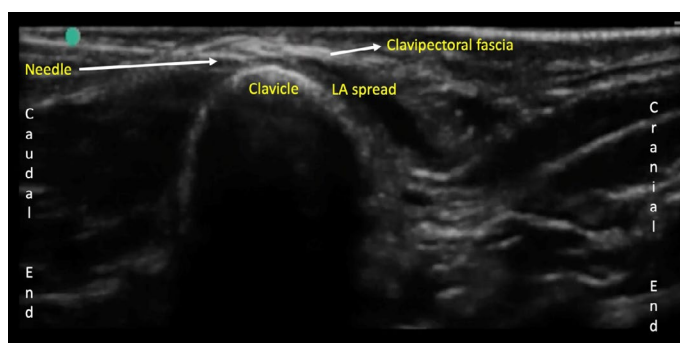


Figure 2: A high-frequency linear probe (Sonosite HFL38x/13-6MHz; Fujifilm SonoSite, Bothell, WA) was placed in the craniocaudal direction on the anterior surface of the right clavicle 2 cm away (horizontally) from the fracture line.



Figure 3: Pujunk needle ultrasound-visible stimulation was advanced in a caudad to cranial direction using an in-plane technique until it reached the clavipectoral fascia.

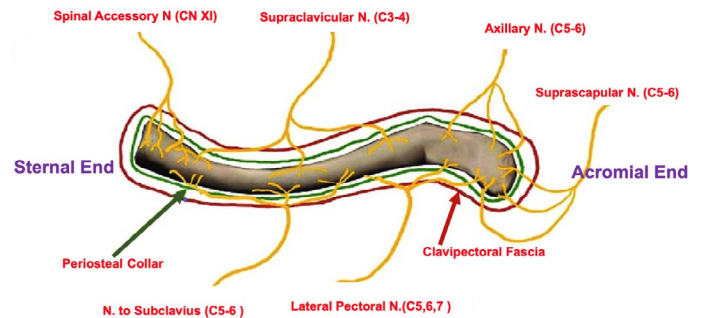


Figure 4: Distal branches of all the above nerves pierce the clavipectoral fascia and supply the clavicle.

safe, relatively simple technique of anaesthesia and analgesia for ORIF of compound clavicle fracture. Valdés first described CPB in 2017 for internal fixation of the clavicle as a sole anaesthetic technique and intravenous sedation. In his patient, the analgesia lasted more than 12 hours [9]. In their patients in 2020, Yoshimura and Morimoto used CPB and supraclavicular nerve block after general anaesthesia. Their effects were almost the same as brachial plexus nerve block but without complications [10]. A recent case series by Kukreja P, et al. [3], used CPB before offering general anaesthesia for their patients. They had excellent results in terms of fewer requirements for opioids and patient satisfaction.

In our case, the patient complained of severe pain and ulcerative colitis. We used CPB because she developed complications with opioids in the emergency department. Surgeons agreed to fix the fracture because of the nature of the injury, and we also need a perioperative analgesia plan. Therefore, we decided to opt for a safer alternative than ultrasound-guided ISB and SCPB. We used bupivacaine with adrenaline (0.375%) for prolonged analgesia, which kept the patient comfortable for more than 16 hours. We found this a safe, reliable opioid-sparing, allowing us to discharge the patient earlier.

Conclusion

CPB is a safe alternative, opioid-sparing analgesia technique for compound clavicular fracture fixation. It mainly blocks the distal nerves supplying the clavicle, therefore very comfortable for the patients and without any significant complications. It is a safer technique for providing perioperative analgesia if anyone is unsuitable for common analgesics, e.g., NSAIDs or opioids.

References

1. Ropars, M., H. Thomazeau, and D. Hutten. "Clavicle fractures." *Orthop Traumatol Surg Res* 103 (2017): S53-S59.
2. Sonawane, Kartik, Hrudini Dixit, J. Balavenkatasubramanian and Palanichamy Gurumoorthi. "Uncovering secrets of the beauty bone: a comprehensive review of anatomy and regional anesthesia techniques of clavicle surgeries." *Open J Orthop Rheumatol* 6 (2021): 019-029.
3. Kukreja, Promil, Camille J. Davis, Lisa MacBeth, Joel Feinstein and Hari Kalagara. "Ultrasound-guided clavipectoral fascial plane block for surgery involving the clavicle: a case series." *Cureus* 12 (2020).
4. Leurcharmee, Prangmalee, Naraporn Maikong, Perada Kantakam and Pagorn

- Navic, et al. "Innervation of the clavicle: a cadaveric investigation." *Reg Anesth Pain Med* 46 (2021): 1076-1079.
5. Ince, Ilker, Alper Kilicaslan, Vicente Roques and Hesham Elsharkawy, et al. "Ultrasound-guided clavipectoral fascial plane block in a patient undergoing clavicular surgery." *J Clin Anesth* 58 (2019): 125-127.
 6. Brull, Richard, Colin JL McCartney, Richard J. Sawyer and Herbert P. von Schroeder. "The indications and applications of interscalene brachial plexus block for surgery about the shoulder." *Acute Pain* 6 (2004): 57-77.
 7. Banerjee, Swarna, Ranjita Acharya and Bhavna Sriramka. "Ultrasound-guided inter-scalene brachial plexus block with superficial cervical plexus block compared with general anesthesia in patients undergoing clavicular surgery: a comparative analysis." *Anesth Essays Res* 13 (2019): 149.
 8. Johnson, Rebecca L., Sandra L. Kopp, JENS Kessler and Andrew T. Gray. "Peripheral nerve blocks and ultrasound guidance for regional anesthesia." *Miller Anesth* 29 (2019): 1-2.
 9. Valdés, L. "As part of the lecture: analgesia for clavicular surgery/fractures 36th annual ESRA Congress." *Lugano, Switzerland* (2017).
 10. Yoshimura, Manabu and Yasuhiro Morimoto. "Use of clavipectoral fascial plane block for clavicle fracture: two case reports." *Saudi J Anaesth* 14 (2020): 284-285.

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