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Case Report

ANESTHETIC MANAGEMENT OF A PATIENT WITH FRACTURED CLAVICLE WITH PLATE *IN SITU* ROLE OF SITE-SPECIFIC NERVE BLOCK – A CASE REPORT

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ABSTRACT

Surgery of the clavicle with fixation of plate is being done more commonly in the recent years with an intention to give optimal functional outcomes. A repeat injury with broken clavicle with plate *in situ* is relatively rare. A 30-year-old 90 kg male with a BMI of 30 was posted for open reduction and fixation. There was no comorbid illness except a difficult airway. The routine investigations were normal. The plan was to administer Partha's combo block as the patient was obese with difficult airway. There was laceration in the side of front of neck which was painful. An ultrasound-guided superficial cervical plexus block with 5 ml of 0.5% bupivacaine was given to block the side of front of neck and the skin in front of clavicle. This provided a pain-free needling of brachial plexus. The upper trunk of the brachial plexus was blocked with 8 ml of 0.5% bupivacaine. Another 15 ml of 0.25% bupivacaine was administered in the Clavipectoral fascia plane to knock out any possible failure of the above blocks. The presence of a plate and a previous scar made the block challenging. Three milliliters of 0.25% bupivacaine were used in the middle of chest to block the nerves from the other side. The surgery was uneventful and the duration was 2 h. Only 25 µg of intravenous fentanyl was used intraoperatively. This case report is presented for its rarity, where a non-virgin clavicle was fixed with combined site-specific blocks in an obese patient with difficult airway.

Keywords: Fracture, Clavicle, Anesthesia, Regional, Nerve blocks.

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INTRODUCTION

Clavicle fractures following trauma, especially in young patients, are fixed for optimal functional outcomes, while in non-displaced fractures, conservative management may be considered. Clavicular surgery can be performed under general or regional anesthesia with peripheral nerve blocks [1]. The supraclavicular nerves arise from the C3 to C4 cervical nerves. It innervates the skin which overlie the clavicle. The upper trunk of the brachial plexus includes the dorsal scapular nerve, the long thoracic nerve, the suprascapular nerves, and the nerve to the subclavius. It is possible to perform increasingly focused blocks with the use of ultrasonography in regional anesthesia, thus allowing greater safety and definitiveness for the anesthetic-surgical procedure [1,2]. The superficial cervical plexus block may be used alone or in combination with brachial plexus block for perioperative analgesia for clavicle surgery. A combined administration of blocking supraclavicular nerves, along with selective upper trunk (SCUT) of the brachial plexus [3,4], have been used successfully used in both clavicular surgeries and pacemaker insertion. We report a redo case of fracture clavicle with site specific regional anesthesia technique.

CASE REPORT

A 30-year-old 90-kg male with no known comorbidities had a history of a road traffic accident in which he sustained a shoulder injury. There was no history of loss of consciousness, ENT bleed, or any other injury. X-ray of the shoulder revealed mid 1/3rd shaft of clavicle with hardware inside (Fig. 1a). The orthopedic team had planned for removal of the existing plate with fixation of a new plate. The patient was obese, hemodynamically stable and all routine investigations were within normal limits. An airway examination revealed a Mallampatti score of 4 with decreased mandibular space. A written informed consent was obtained from the patient before the procedure for regional anesthesia. On shifting the patient to the operating room, the routine monitors were attached and baseline vitals were noted. The patient was placed in supine position with the head tilted toward the other side and a pillow was placed beneath the left shoulder. The area from the neck to below the clavicle was cleaned with povidone iodine solution. Using the ultrasound, scanning was done to identify the carotid artery, internal jugular vein, sternocleidomastoid muscle, and the superficial cervical plexus. Once a clear view of the superficial cervical plexus was seen, through the technique of in-plane needling, the needle was advanced, and 5 ml of 0.5% bupivacaine was injected (Fig. 1b). The area of laceration in front of neck was anesthetized within 5 min. Afterward, the pain-free needling was done to identify the upper trunk of the brachial plexus. Six milliliters of 0.5% bupivacaine were injected surrounding the upper trunk (Fig. 1c). There was almost a near complete reduction of pain in the fracture site in 5 min. In addition to these blocks, Clavipectoral fascia (CPF) plane block was performed by injecting 12 ml of 0.25% bupivacaine. The existence of the plate and the scar tissues above the clavicle made the identification of the plane challenging. In the upper part of the chest, just below the suprasternal fossa, 3 ml of 0.25% bupivacaine was infiltrated subcutaneously for 5 cm. The total volume was well within safe limits. Intraoperatively, 25 µg of intravenous fentanyl only was used for sedation. The patient was hemodynamically stable throughout the intraoperative period (Fig. 1d). No complications were noticed while performing the procedure.

DISCUSSION

The innervation of the clavicle is compounded and contentious due to the absence of validated cadaver studies. The clavicle is supplied by both the cervical and brachial plexus Thus, any single block is usually not adequate to provide effective surgical anesthesia or worthwhile perioperative analgesia. For clavicle surgeries, regional anesthesia alone as a sole anesthetic technique was not commonly practiced due to multiple nerve supply of the clavicle [5]. The subclavian nerve, the supraclavicular nerve, and the lateral pectoral nerves may be contributing to the innervation of clavicle. The role of accessory nerve is minimal. The introduction of ultrasound with selective identification of nerves and roots has revolutionized regional anesthesia in such surgeries. Hence, we also performed the CPF plane block to remove the doubts of any failure as there are studies with SCUT block alone, there may be 4% incidence of failures. As the patient was obese, with difficult airway, we did not want to take chance of a

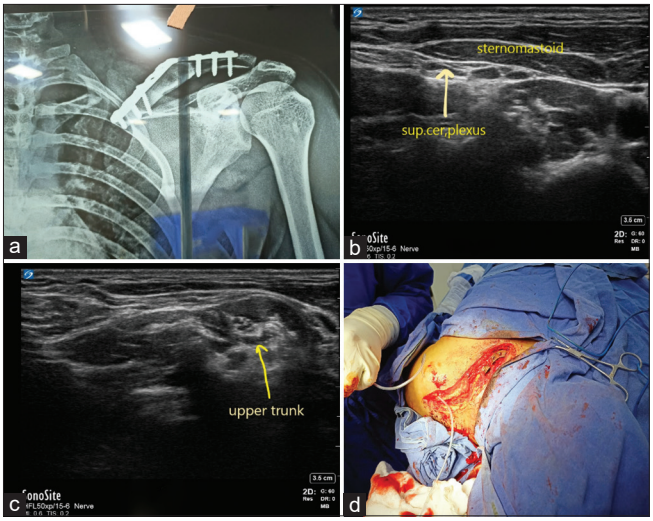

Fig. 1: (a) Fracture clavicle, (b) USG of superficial cervical plexus, (c) USG of upper trunk of brachial plexus, and (d) removed old plate and a new plate *in situ*

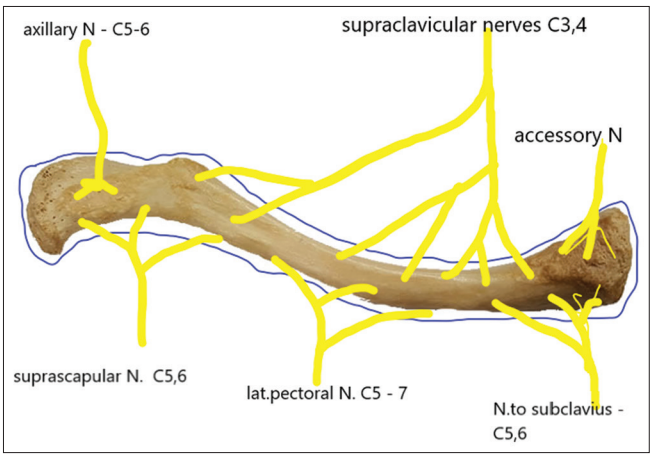

Fig. 2: Showing innervation of clavicle with root values

possible failure and proceeded with an added CPF plane block. The already existing plate completely shadowed the ultrasound image, but still, we could locate the plane to administer the local anesthetic drug. The combination of ultrasound-guided interscalene and superficial cervical plexus block has been successfully used for open reduction and internal fixation of clavicle fracture. All the sensory nerves supplying the clavicle penetrate the CPF to innervate clavicle, and hence, blocking the CPF provides better perioperative anesthesia and analgesia [6]. The nerve supply of the clavicle is represented in Fig. 2. The spinal accessory nerve as a cranial nerve cannot be blocked in such combined nerve blocks. There is a small role of C7 which can be spared with upper trunk block [7]. Considering these site-specific nociception and innervations, we added CPF block. We thought with such a major procedure, this could have resulted in complete deafferentation. Even though there is more of anatomical interest with accessory nerve, we did not take any chance as the patient was considered a case of difficult airway. We preferred to give a higher volume in each of the sites especially upper trunk to decrease a possible discomfort during traction for reduction of fragments. The duration of analgesia was 24 h as we used 0.5% bupivacaine. Regional anesthesia results in effective analgesia with less opioid usage and a consequential decrease in post-operative nausea and vomiting we did use only a combination of oral aceclofenac and paracetamol for post-operative pain relief. The patient had an uneventful post-operative period.

CONCLUSION

We successfully report that a case of clavicle fracture coming for surgical intervention can be managed using regional anesthetic techniques. A combined blockade of superficial cervical plexus, upper trunk of brachial plexus, and CPF plane block with midline subcutaneous infiltration (Partha's combo block) can provide effective perioperative anesthesia and post-operative analgesia. Such extensive and effective coverage of nociceptive areas may be critical in such non-virgin cases. There were no complications.

AUTHORS' CONTRIBUTIONS

Dr. GJ has done the case. Dr. SPS has done the write up and communication.

CONFLICTS OF INTEREST

Nil.

FINANCIAL SUPPORT

Nil.

PATIENT CONSENT FOR PUBLICATION

Yes.

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