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Case Report

SURFACE ANATOMY-BASED CLAVIPECTORAL FASCIA PLANE BLOCK FOR CLAVICLE SURGERY

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ABSTRACT

Introduction: Clavicular fractures are often observed cases. In the majority of clavicle fractures, both in adults and children, the fracture is located in the midshaft. Generally, General Anesthesia techniques are usd in such instances, as regional anesthesia through peripheral nerve block often presents its own challenges. The clavipectoral fascial plane block was first introduced in 2017. Apart from its ease of implementation, the Surface Anatomy-Based Clavipectoral Plane Block can avoid the risks associated with other regional anesthesia techniques such as Plexus Brachialis Block or Interscalene Block. **Objective:** This report aims to provide an overview of the procedures for carrying out surface anatomy-based clavipectoral fascia plane block for clavicle surgery. **Case Report:** A 33-year-old man with the primary complaint of pain in the right shoulder following a fall while playing football. The patient was diagnosed with closed re-fracture of the clavicle (D) Allman Group I. Clavicle surgery was conducted with the Surface Anatomy-Based Clavipectoral Fascia Plane Block technique. In this patient, local anesthetic agents were administered as Levobupivacaine 0.375% in a volume of 20 cc. The operation lasts approximately 1.5 hours. The Patient's hemodynamic condition was stable during the surgery. The patient had no complaints and post-operative pain was effectively managed. **Conclusion:** The surface Anatomy-based Clavipectoral fascia plane block can be considered for clavicular surgery, especially in Allman Group type 1. Besides being easy to implement, this technique also poses fewer risks compared to other regional anesthesia techniques.

Keywords: Clavicula, Claviperctoral Fascia Plane Block, Clavicle Fractures, Fascia Clavipectoral, Traffic Accident and Injury

ABSTRAK

Pendahuluan: Fraktur pada tulang klavikula merupakan kasus yang umum ditemui. Pada sebagian besar fraktur klavikula, baik pada dewasa maupun anak-anak, lokasi patahan terletak pada bagian midshaft. Secara umum, teknik anestesi umum menjadi pilihan pada kasus-kasus seperti ini, karena teknik anestesi regional melalui *peripheral nerve block* seringkali memberikan tantangan tersendiri. *Clavipectoral fascial plane block* dikenalkan pertama kali pada tahun 2017, Selain karena kemudahan dalam pelaksanaannya, *Clavipectoral Plane Block* berbasis permukaan anatomis dapat menghindari resiko yang mungkin terjadi pada teknik regional anestesi lainnya seperti pada Blok Plexus Brachialis ataupun *Interscalene Block*. **Tujuan:** Laporan ini bertujuan untuk memberikan gambaran mengenai prosedur pelaksanaan blok bidang fascia clavipectoral berbasis anatomi untuk operasi pembedahan klavikula. **Laporan Kasus:** Seorang laki-laki usia 33 tahun dengan keluhan utama nyeri pada bahu kanan setelah terjatuh saat bermain sepak bola. Pasien didiagnosis dengan *closed re-fracture clavicula* (D) Allman Group I, dilakukan Tindakan ORIF Clavicula dengan teknik *Clavipectoral Fascia Plane Block* berbasis permukaan anatomis. Pada pasien ini digunakan agen anestesi lokal yaitu Levobupivakain 0.375% sebanyak 20 cc. Operasi berlangsung kurang lebih 1.5 jam. Kondisi hemodinamik pasien terbilang stabil selama operasi berlangsung. Pasien tidak memiliki keluhan sepanjang operasi dan nyeri pasca operasi dapat tertoleransi dengan baik. **Kesimpulan:** *Clavipectoral fascial plane block* berbasis permukaan anatomis dapat menjadi pilihan pada kasus pembedahan tulang klavikula terutama pada kelompok Allman 1. Disamping pelaksanaannya yang mudah, teknik ini juga memberikan risiko yang lebih sedikit jika dibandingkan teknik regional anestesi lainnya.

Kata kunci: Clavicula, *Claviperctoral Fascia Plane Block, Fraktur Clavicula, Fascia Clavipectoral*, Kecelakaan Lalu Lintas dan Cedera

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INTRODUCTION

Clavicular fractures are cases that we often encounter. A clavicle fracture can result from various causes, such as a traffic accident or a fall during activities. In the majority of clavicle fractures, both in adults and children, the fracture is located in the midshaft (1). Generally, the general anesthesia (GA) technique is preferred in such instances, as regional anesthesia through peripheral nerve block often presents its own challenges. Several published case reports and series have been reported the efficacy of a brachial plexus block (interscalene approach) or a combination block (interscalene with cervical superficialis) (2,3). However, performing two different blocks plus using ultrasonography as guidance can be something time-consuming.

The clavipectoral fascial plane block was first introduced in 2017 by Dr. Luis Valdes at the European Society of Regional Anesthesia and Pain Therapy Congress (4–7). Apart from its ease of implementation, the Surface Anatomy-Based Clavipectoral Plane Block can avoid the risks associated with interscalene blocks, including ipsilateral nerve palsy, vocal cord paralysis, and pneumothorax (3). Blocks can deliver effective post-operative analgesia when utilizing long-acting agents, less opioid use, and disminished postoperative nausea and vomiting in comparison to general anesthesia (8).

CASE REPORT

A 33-year-old man presented with complaints of pain in the right shoulder following a fall during playing soccer. The patient reported that he fell with his right shoulder hitting the field first. There was no history of fainting, vomiting, or seizures. Subsequent to the incident, the patient reported exacerbated pain in the right shoulder with movement. Previous history of asthma, allergies, hypertension, diabetes mellitus, seizures, breathing difficulties, and familial diseases are denied. The patient experienced a previous anesthesia procedure in 2007 for Clavicle Surgery and again in 2010 for the Removal of an Implant from the clavicle.

The physical examination found a height of 174 cm, a weight of 97 kg with a BMI of 32 kg/m^2 categorizing him as obese class I. The vital signs examination found a Blood Pressure of 110/70 mmHg, Heart Rate of 84 beats per minutes, Respiratory Rate of 20 breaths per minutes, temperature of 36.5°C, and oxygen saturation (SpO2) of 98% with nasal cannula of 3 lpm oxygen in a supine position. Airway is clear, respiration is sufficient, circulation is normal. The examination of heart and lung found no abnormalities.

Local examination of the right claviclular region found cicatricial changes, accompanied by swelling in the middle 1/3, unclear deformity. Tenderness present, crepitus observed in the middle 1/3 of the clavicle, neurovascular disturbance disruption absent, SpO2 digits 1-5: 97%-99%. The movement examination found limited shoulder range of motion (ROM), positive discomfort, but the elbow and wrist exhibited complete range of motion.

The results of PA Thoracic X-ray indicate lung contusion, mild bilateral pleural effusion with differential diagnosis of Hematothorax, a comminuted fracture in the middle 1/3 of the right clavicle accompanied by soft tissue swelling, and complete fractures of the right posterior ribs 3, 4, and 5. Assessment of invalid cast conducted (Figure 1).

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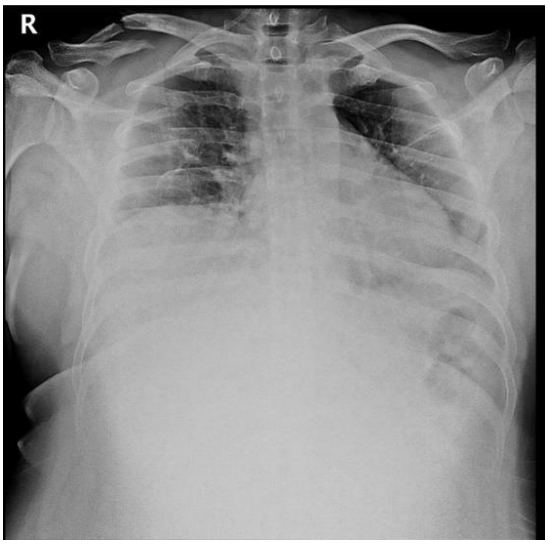

Figure 1. Posteroanterior Thoracic X-ray Before Surgery

Preoperative anesthetic assessment indicated a 33-year-old male with close re-fracture of the clavicle (D) Allman Group I, segmental type, scheduled for open reduction and internal fixation (ORIF) of the clavicle using an S-plate, with a physical status classified as ASA II, and a plan for Clavipectoral Block. The patients presented with lung contusions, mild bilateral pleural effusion, and Hematothorax, without severe respiratory distress. The patient's untritional state is indicated by a BMI of 32 kg/m2 (categorized as Obese Class I)

The patient was scheduled for clavicle surgery utilizing an S-plate, clasified as ASA II, with clavipectoral block anesthesia planned. The patient's operative preparation and management will be explained in detail before to, during, and after the operation. In this case, ORIF of the clavicle was performed utilizing the clavipectoral block anesthesia technique. In this patient, Levobupivacaine 0.375% was administered as 20 cc with injection in three sides of the clavicle. The injection was administered in the medial end, the location of the fracture, and the lateral end.

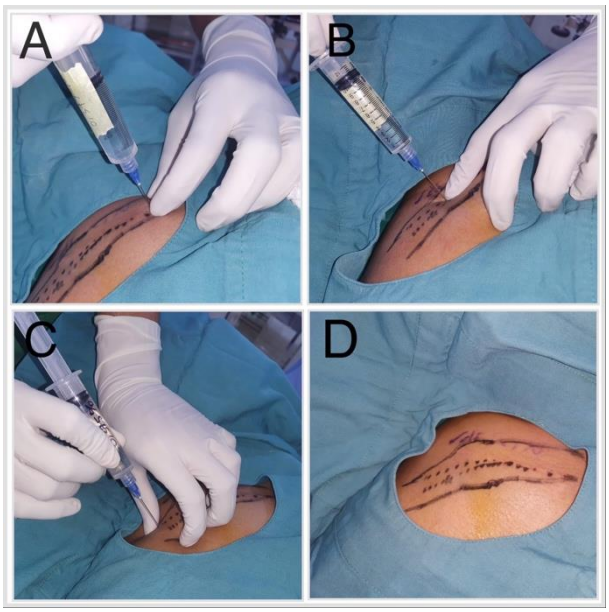

Figure 2. Injection Site of the Local Anesthetic Agent.
(A: Injection at the lateral end site; B: Injection at the fractured bone site; C: Injection at the medial end site; D: Clavicle and Incision marker from the surgeon)

The operation lasts approximately 1.5 hours. The hemodynamic stability of operation is maintained as,a systolic blood pressure of 110-140 mmHg anddiastolic blood pressure of 70-79 mmHg,respiratory rate of 18-20 breaths perminute,heart beart of 75-90 beats per minute, lifting strength, regular SpO2 of98% with nasal cannula at 3 lpm oxygen.

Table 1. Intraoperative Hemodynamic Monitoring

Hemodynamic	Value						
Time (WIB)	13.00	13.15	13.30	13.45	14.00	14.15	14.30
Systole (mmHg)	140	136	110	115	110	140	132
Diastole (mmHg)	79	74	70	72	74	76	74
HR (bpm)	90	88	70	72	76	83	88
SpO2 (%)	100	100	100	98	99	100	100

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The administered surgical medications include Ondansetron 4mg intravenously, Injection of Paracetamol 1 gr intravenously, and Midazolam 3 mg. Throughout the duration, 3 lpm of O_2 is administered via a nasal cannula.

Hemodynamics during surgery are presented in table 1. The postoperative condition was recorded with vital signs of blood pressure at 138/77 mmHg, heart rate at 82 beats per minute, respiratory rate at 20 breaths per minute, and oxygen saturation (SpO2) at 98% while receiving oxygen through nasal cannula at 3 liters per minute. Following the completion of the operation, the patient was transferred back to the ward. The patient was administered paracetamol 1 gram every 8 hours for postoperative pain treatment.

DISCUSSION

A frequently encounter case is clavicle surgery. Regional anesthesia options for the clavicle consist of plexus blocks, truncal blocks, or fascial plane blocks. Plexus blocks involve the cervical plexus (such as superficial cervical plexus block or selective supraclavicular nerve block) with or without brachial plexus block (such as interscalene block) (2,3,9). The clavipectoral fascial plane block was first introduced in 2017 by Dr. Luis Valdes at the European Society of Regional Anesthesia and Pain Therapy Congress. The CFPB can administer anesthetic or analgesia to the clavicle, overcoming the shortcomings of other blocks associated with plexus blocks (6). Although, the CFPB was initially administered with ultrasound guidance, can alternatively be performed using anatomical marker guidance with equal effectiveness. Apart from its convenience, the CFPB also provides through reduced risk relative to other block techniques (7,10). However, the CFPB also has weaknesses, particularly when the fracture is not centrally located on the clavicle or if the operator performs an incision sufficiently broad to pass through the clavicle.

However, effective planning and collaboration between the anesthesiologist and operator are needed to identify the area of operation to be carried out. This technique has limitations, especially regarding the operating area, so it is necessary to communicate comprehensively with the operator before action begins.

CONCLUSION

As time progresses, new regional anesthetic techniques are also developing which combine various perspectives, thereby enhancing our selection of anesthesia techniques. The clavipectoral block can be an option as a standalone anesthetic technique or used as part of multimodal analgesia. Despite its advantages, this technique also has weaknesses including limited types of operations that can be applied. The clavipectoral block technique can be considered for patients undergoing clavicular surgery, but it is risky when general anesthesia is administered without access to equipment resources such as ultrasound.

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Conflict of Interest

The authors declare no conflict of interest.

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Author's Contributions

All authors have contributed to all processes in this case report.

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