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Olgu Sunumu/*Case Report*

The Combination of Two Regional Anesthesia Techniques in a High-Risk Patient: A Case Report

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Yüksek Riskli Bir Hastada İki Rejyonel Anestezi Tekniğinin Kombinasyonu: Olgu Raporu

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ABSTRACT

It is necessary to open subcutaneous arteriovenous fistulas for patients with chronic renal failure for the future steps of dialysis. These surgical procedures are performed under sedation, local anesthesia, regional anesthesia, or general anesthesia. In this case report, we shared our anesthesia experience in a patient with comorbid diseases, high BMI, and difficult airway to undergo fistula surgery between the left brachial artery and the left axillary vein. We performed serratus anterior plane block and infraclavicular block which was successful, and the surgical procedure was performed comfortably without any complications. Infraclavicular block and upper-level serratus anterior plane block can be applied together for anesthesia of the T1-T2 dermatome.

Keywords: *arteriovenous fistula, brachial plexus block, infraclavicular block, interventional ultrasound, serratus anterior plane block*

ÖZ

Kronik böbrek yetmezliği olan hastaların diyalize girebilmeleri için deri altı arteriyovenöz fistül açmak gerekir. Bu cerrahi işlemler sedasyon, lokal anestezi, bölgesel anestezi veya genel anestezi altında gerçekleştirilir. Burada komorbid hastalıkları olan, vücut kitle indeksi yüksek, zor hava yolu bulunan ve sol brakial arter ver sol axillar ven arasında fistül cerrahisi yapılacak bir hastada anestezi deneyimimizi paylaştık. Bu vakada serratus anterior plan bloğu ve infraklaviküler blok uyguladık. Uyguladığımız teknik başarılı oldu ve cerrahi işlem rahatlıkla sorunsuz bir şekilde gerçekleştirildi. T1-T2 dermatomunun anestezisi için infraklaviküler blok ve üst seviyeden serratus anterior plan bloğu birlikte uygulanabilir.

Anahtar kelimeler: *arteriyovenöz fistül, brakiyal pleksus bloğu, infraklaviküler blok, girişimsel ultrason, serratus anterior plan bloğu*

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INTRODUCTION

The surgery of subcutaneous arteriovenous fistula (AVF) was first performed in 1966 to allow patients with chronic kidney failure to undergo dialysis. The procedure is performed by anastomosis of the artery and a nearby superficial vein after incision of the skin and subcutaneous tissues [1].

The infraclavicular block is a technique aiming at blocking the C5-T1 branches of the brachial plexus and provides anesthesia that starts from the distal of the humerus and is useful in the entire forearm [2]. Serratus anterior plane block is a technique that has been described in recent years and aims to block the thoracodorsal nerve (anesthesia in thoracic dermatomes, T2-T12) [3].

Fistula surgeries, are performed under local anesthesia, regional anesthesia, or general anesthesia techniques [4]. In our clinic, generally a combination of deep-sedation and local anesthesia is preferred

for fistula surgeries.

In this case, the area to be applied fistula surgery was on an unusual location. The patient had comorbid diseases, high BMI, and difficult airway. In this case report, the combination of deep sedation and local anesthesia is discussed.

CASE REPORT

A 56-year-old female patient with chronic renal failure (CRF), hypertension, and previous coronary by-pass history needed a new fistula. She had previousely a fistula surgery in a more distally area then usual. New fistula surgery with grafts between the left brachial artery and the left axillary vein was planned in this female patient with weight 83 kg and height 156 cm (BMI 37 kg/m^2) (Figure 1).

The hypertensive patient was not regulated despite the use of dual antihypertensive drugs and had been on fistula dialysis for five years due to CRF. Coumadin and acetylsalicylic acid, coumadin and acetylsalicylic acid intake was discontinued a week before surgery, and switched to subcutaneous Low Molecular Weight Heparin (LMWH). The INR value was calculated as the patient's weight. The patient's laboratory tests, who had been on dialysis the day before, were consistent with the routine post-dialysis tests of the CRF patients. The patient was evaluated by the American Society of Anesthesiologists III (ASA III). He had a short and thick neck (Mallampati III). It was found that the surgical procedure site was compatible with the left arm C8-T1-T2 dermatomes. It was decided to perform the surgical procedure with regional techniques due to the patient's existing comorbid diseases. However, it was not possible to anesthetize the dermatome area of the surgery with a single regional anesthesia technique. Therefore, we decided to anesthetize this area by applying the infraclavicular block and the upper serratus anterior plane block. The patient was informed about the anesthesia technique written, and verbal consent was obtained.

The patient, whose LMWH was skipped on the day of surgery, was taken to the operating room for the procedure. The patient, placed in the supine position, was monitored by the ASA guidelines, and appropriate vascular access was provided. Vital signs of the patient TA; 170/104 mmHg, pulse; 105 bpm, fingertip O_2 saturation; 90% (with 2 L/ min O_2 support).

Just before the procedure, 2 mg of Midazolam iv was given to the patient. For the block procedure, 40 ml of fluid with 20 mL of 2% lidocaine and 20 mL of

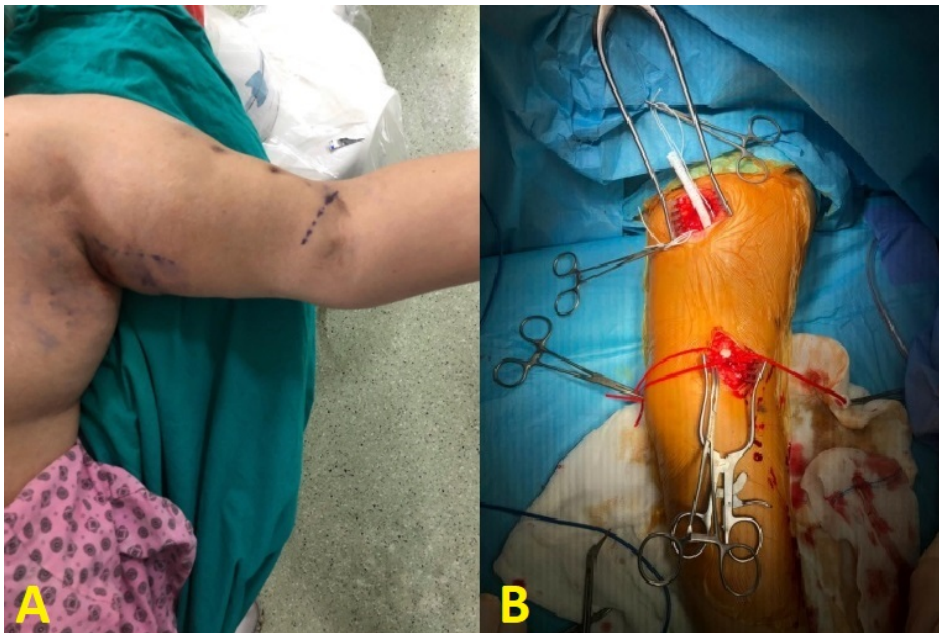

Figure 1. A: Surgery planned area, B: Surgical procedure area.

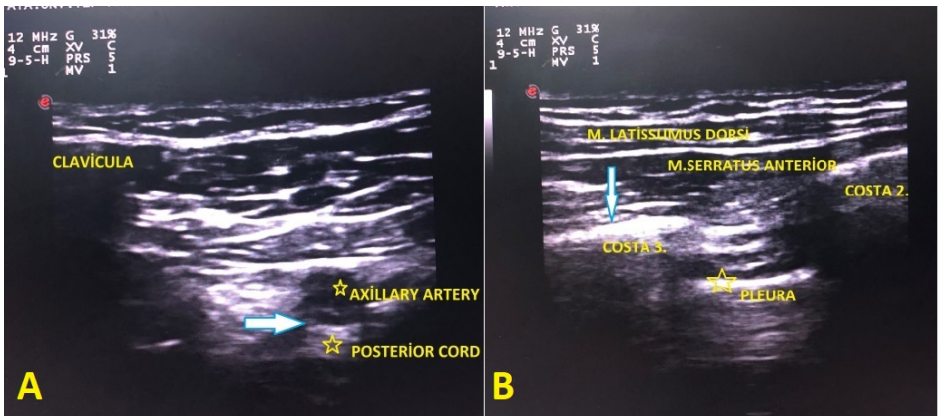

Figure 2. Anatomy under US; A: Infraclavicular block, B:serratus anterior plane block. Arrows show the injection point.

0.5% bupivacaine added to 1/200,000 adrenaline was used. 15 mL of the fluid was used for infraclavicular block and 25 mL for serratus anterior plane block (considering the toxic dose). The linear ultrasound (US) probe (Esaote MyLab30®, CA631 high-frequency probe, United Kingdom) was covered in a sterile manner, and the skin in the block areas was sterilized with 2% chlorhexidine and prepared for the process. Both blocks were performed with US, linear probe, and 100 mm and 20-gauge block needle (Stumplex® Ultra 360®, Braun, Germany) using an in-plane technique with instant imaging.

During the infraclavicular block procedure, the US probe was placed 1 cm anterior to the coracoid process in the sagittal plane. The needle was placed at the intersection point of the coracoid process and the clavicle using the in-plane technique in line with US imaging. The needle was advanced in the 8-clockwise direction of the axillary artery. After seeing no blood in the aspiration, 15 mL of anesthetic fluid was injected between the posterior cord and the artery (Figure 2).

For the serratus, anterior plane block, the patient's position was brought to the right lateral decubitus position. The left arm of the patient was placed in the abduction and over the head. The US visualized the third rib and the serratus muscle at the posterior axillary line. With the in-plane technique, the block was advanced until it touched the third rib with the needle, and after it was seen that no blood came out in the aspiration, 15 ml of anesthetic fluid was injected into the plan. Cranial and caudal spread were observed. The needle tip was advanced until it touched the second rib, and after it was seen that there was no blood in the aspiration, 10 ml of local anesthetic was injected into the fluid plan (Figure 2).

Thirty minutes after the procedure, the patient could not distinguish between hot and cold in the left C5-C6-C7-C8-T1-T2-T3 dermatomes. Finally, 1 mg of Midazolam and 50 mcg of Fentanyl were administered just before the surgery. The fistula was successfully opened in 2 hours (Figure 1). Fluid replacement with ringer's lactate and 2 L. min-1 oxygen support was given during surgery. The patient, who did not feel pain during the procedure and fully recovered after the procedure, was followed up in the waking unit for a short time and was sent to the service with an open mind and full cooperation, without neurological deficits. No complications occurred in the early and late postoperative period.

DISCUSSION

The infraclavicular block is an easy and comfortable technique aiming to block the C5-T1 branches of the brachial plexus, starting from the distal humerus in the upper extremity, providing anesthesia- analgesia for the whole arm. It is successfully used in upper extremity surgeries [2].

The serratus anterior plane block is a block that has been described in recent years and aims to block the thoracodorsal nerve (anesthesia in thoracic

dermatomes, T2-T12) [3]. It is used in breast surgeries, rib fractures, thoracic surgeries, and traumas to provide analgesia in the postoperative period and in the placement of subcutaneous implantable cardioverter-defibrillator (S-ICD) for the intraoperative anesthesia [5-8].

Following nerve blocks for the brachial plexus applied for upper arm surgeries, T1 and T2 dermatomes cannot be adequately anesthetized [9,10]. Pain sensation negatively affects the comfort of both the patient and the surgeon and the surgery's quality.

It has been shown that peripheral nerve block applied for upper extremity fistula surgeries decreases peripheral vascular resistance, increases local blood flow, leads to venous dilatation, and decreases pulsatility index [11,12].

General anesthesia can be performed with a laryngeal mask or intubation, depending on the procedure's duration. The laryngeal mask may not be safe in surgeries such as this case with high BMI, long surgical duration, and head position. Like our patient, difficulties may be encountered in inserting airway devices in patients with difficult airway.

General anesthesia was not administered to this patient having comorbid diseases, difficult airway, high BMI, right rotation of the head, and low preoperative O_2 saturation. Continuous local infiltration and sedation was not found safe and sufficient due to the patient's problems. Also, local anesthesia was not applied due to the fact that deeper tissues would be studied and the surgical area could be extended more proximally (T2-T3 dermatomes). Also intercostobrachial nerve block was not performed due to the possibility of the surgical area being more proximal and widening to the subclavian area (T2-T3 dermatomes). It was decided to use two regional anesthesia techniques in combination to anesthetize the T2 dermatome. Therefore, infraclavicular block and upper-level serratus anterior plane block were applied to the patient with US using an anesthetic dose of local anesthetic. Our combined block technique enabled the surgery to be completed successfully without causing any discomfort or pain during the operation. The patient, who did not develop any problems during follow-up in the recovery unit, was sent to the service.

During block procedures, due to risks such as vascular or nerve injury, intravascular injection of a local anesthetic agent, local anesthetic toxicity, pain-related vasovagal syncope, and pneumothorax care should be taken [13]. High attention should be paid to the anesthetic status and vital signs of the patients at every surgery stage.

Infraclavicular block and upper-level serratus anterior plane block can be applied together to provide adequate anesthesia in complicated patients with high BMI, comorbid diseases, poor lung function, difficult airway, and upper extremity surgery, including the T1-T2 dermatome areas.

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