Austin Journal of Anesthesia and Analgesia

Open Access

Austin Publishing Group

Case Report

Combined Continuous Adductor Canal Block and Sub-Sartorial Fascial Block: Much more than Peripheral Nerve Block

Fusco P[1], Petroni GM[2], Nazzarro E[3]*, De Sanctis F[2], Sanapo A[2] and Liberati N[4]

[1]Departement of Anesthesia and Intensive Care Unit, SS Filippo and Nicola Hospital, Avezzano, L'Aquila, Italy

[2]Department of Anesthesia and Intensive Care Unit, S. Maria Hospital, Terni, Italy

[3]Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy

[4]Departement of Anesthesia, Hospital "Di Lorenzo" Avezzano, L'Aquila, Italy

***Corresponding author:** Emanuele Nazzarro, Department of Life, Health and Environmental Sciences, University of L'Aquila, L'Aquila, Italy

Email: emanuele.nazzarro2@gmail.com

Received: March 04, 2025;

Accepted: March 24, 2025;

Published: March 27, 2025;

Abstract

Fifty-eight percent of patients undergoing TKA surgery experience moderate to severe pain in the postoperative period. Inadequate pain control can lead to complications such as venous thrombosis, coronary ischemia, myocardial infarction, and pneumonia, thus increasing morbidity. In addition, failure to manage postoperative pain adversely affects rehabilitation and physical therapy and results in longer hospital stays and higher care costs [3]. Therefore, pain reduction in patients after TKA is of great importance. To achieve pain reduction, multimodal analgesia strategies have been developed instead of single-option analgesics. Multimodal analgesia includes the systemic use of intravenous drugs and locoregional anesthesia techniques. The growing interest in multimodal analgesia regimens is due to their ability to reduce systemic opioid consumption and related side effects.

Keywords: Canal Block; Pain reduction; Anesthesia; Femoral nerve block; Total Knee Arthroplasty

Introduction

Due to its high analgesic efficacy, femoral nerve block (FNB) has traditionally been a critical component of multimodal analgesia. However, FNB causes motor movement limitations in the quadriceps muscle, thus limiting physical therapy. This condition leads to delays in ambulation and discharge. Therefore, new methods of peripheral nerve blockade have emerged to achieve pain control without causing motor blocks. Adductor canal block (ACB) is a successful alternative to FNB that provides adequate analgesia to the anterior compartment of the knee. ACB is a sensory block that targets the saphenous nerve, a sensory nerve that runs within the adductor canal of the thigh, thus preserving motor function. For targeting additional nerve branches involved in TKA we have added to the ACB the Subsartorial Plexus Block, a technique that, using a special multi-orifice needle, aimed to block both the medial retinacular nerve and the infrapatellar branch of the saphenous nerve with a single injection. This technique aims to block both the subsartorial plexus for anterior knee analgesia and infrapatellar branch of the saphenous nerve with a single injection a proximal ACB. Compared with FNB, CBA offers the advantage of early ambulation.

In this context, fascia blocks could allow trigger points reduction especially when associated with adductor canal block, reducing myofascial unit stiffness and speed up patient recovery.

Case Presentation

A 78-year-old female weighing 65 kg and measuring 165 cm in height presented with a medical history of:

- Arterial hypertension under pharmacological treatment,
- Non-insuline-dépendent diabètes mellites,
- Home therapy with clopidogrel for primary prevention of dyspnea with negative coronary angiography (discontinued 10 days before surgery and replaced with 4,000 UI/day of subcutaneous enoxaparin).

Upon admission to the operating room, after patient identification and surgical site verification according to the checklist, a peripheral vein was cannulated using an 18G catheter, followed by intravenous lactated Ringer's solution and antibiotic prophylaxis.

After appropriate multiparametric monitoring, the patient was placed in the lateral decubitus position with the operative limb superior. A spinal anesthesia (BSA) was performed at the L3-L4 interspace using a 27G needle with an introducer, administering 15 mg of 0.5% levobupivacaine. Motor and sensory block of the operative limb was achieved within 5 minutes, after which the patient was repositioned to the supine position.

Citation: Fusco P, Petroni GM, Nazzarro E, De Sanctis F, Sanapo A, et al. Combined Continuous Adductor Canal Block and Sub-Sartorial Fascial Block: Much more than Peripheral Nerve Block. Austin J Anesthesia and Analgesia. 2025; 13(1): 1125.

The procedure lasted 90 minutes with minimal blood loss, aided by the administration of 15 mg/kg tranexamic acid before the surgical incision and continuous infusion at 5 mg/kg/h for 6 hours postoperatively. Sedation was maintained intraoperatively with intravenous propofol at 0.5 mg/kg/h.

Before prosthesis placement, the orthopedic team administered 30 mL of 0.2% ropivacaine into the posterior knee compartment. Postoperatively, an ultrasound-guided perineural catheter (Pajunk E-Cath 18Gx80 mm) was placed in the adductor canal. Prior to puncturing the muscular fascia, were performed:

Sub-Sartorial Fascial Block (SSFB) with 10 mL of 0.9% saline + 0.15% ropivacaine between the sartorius and vastus medialis muscles. Additionally, hydro dissection was carried out below the subsartorial membrane, demonstrating the inverse double bubble sign between the membrane and the femoral artery with 2 mL saline, followed by a bolus of 15 mL of 0.2% ropivacaine. The catheter was connected to an elastomer pump (275 mL, 0.2% ropivacaine at 8 mL/h).

Postoperatively, the analgesic regimen included 1 g of IV paracetamol every 8 hours, with 50 mg of IV ibuprofen as a rescue dose. No opioids were used.

The patient reported no pain postoperatively, with a Numerical Rating Scale (NRS) consistently <4/10 during the first 72 hours, eliminating the need for rescue analgesia. Motor function was preserved, enabling mobilization 8 hours post-surgery and standing the following day with initiation of physiotherapy. In subsequent days, the patient exhibited excellent muscle function and continued physiotherapy pain-free and without stiffness.

Discussion

Postoperative pain following Total Knee Arthroplasty (TKA) is often severe and inadequately managed, impacting patient well-being, satisfaction, and rehabilitation outcomes. Intravenous analgesia alone frequently necessitates morphine, associated with side effects like nausea, vomiting, and hypotension, which can require discontinuation and lead to pain exacerbation or prolonged hospital stays. Multimodal analgesia, including regional anesthesia, is recommended to optimize outcomes.

While femoral nerve block (FNB) has been widely used for post-TKA pain and opioid reduction, it primarily addresses anteromedial knee pain, leaving posterior compartments uncovered and causing quadriceps weakness. Consequently, FNB has been replaced by adductor canal block (ACB), which preserves quadriceps function while providing comparable analgesia for anteromedial pain. However, ACB still does not address posterior compartments, necessitating additional blocks.

Combining ACB with posterior compartment analgesia and Sub-Sartorial Fascial Block of adjacent muscular fasciae may optimize pain control, reduce stiffness, and improve rehabilitation outcomes.

As recently described by Fusco et al. we hypothesize that myofascial trigger points may play a role in post-TKA pain, mediated by the activation of mechanoreceptors and proprioceptors in free nerve endings, increasing muscle stiffness and reducing fascial mobility. Fascial block may facilitate fascial sliding, with local anesthetics acting on free nerve endings to reduce trigger point activation, muscle stiffness, and additional pain sources beyond nociceptive pain. In addition, the fasciae suffer significant insult during the surgical act, resulting in the formation of fibrous scars and lacinias in the fascial planes that reduce their proper sliding, slow recovery and rehabilitation, and promote the onset of chronic postoperative pain. ACB, and also Fascial blocks, help reduce the occurrence of these changes and improve recovery and postoperative pain.

References

1. Nair A, Dolan J, Tanner KE, Kerr CM, Jones B, Pollock PJ, Kellett CF. Ultrasound-guided adductor canal block: a cadaver study investigating the effect of a thigh tourniquet. Br J Anaesth. 2018; 121: 890-898.
2. Pierfrancesco Fusco, Stefano Di Carlo, Paolo Scimia, Emiliano Petrucci, Giulia Degan, Franco Marinangeli. 'Inverse Double Bubble' sign for an effective adductor canal block: a novel approach for the ultrasound confirmation of being on the right site. Reg Anesth Pain Med. 2019; 44: 527-528.
3. Fusco P, Stecco C, Petroni GM, Ciaschi W, Marinangeli F. ESP block and chronic pain: the dark side of the moon. Minerva Anestesiol. 2022; 88: 528–529.
4. Fusco P, Nazzarro E, De Sanctis F, Petroni GM. Can we consider the fascia as the target of our fascial block? Indian J Anaesth. 2024; 68: 832-833.
5. Vora MU, Nicholas TA, Kassel CA, Grant SA. Adductor canal block for knee surgical procedures: review article. J Clin Anesth. 2016; 35: 295-303.