Painless Physiotherapy Application With Femoral Nerve Catheter In A Underwent Judet Quadricepsplasty

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Short Title: Femoral nerve catheter in a underwent Judet quadricepsplasty

Application With Femoral Nerve Catheter In A Underwent Judet Quadricepsplasty

Abstract
Continuous peripheral nerve block is superior to traditional opioid-based analgesia in terms of improved analgesia with reduced sedation, nausea, pruritis, and hospital stay. Continuous peripheral nerve block techniques have advanced significantly in the past decade, particularly due to affordable, high-resolution ultrasound equipment that permits rapid and successful administration and results in reduced procedure-related pain, lower dose requirements, and fewer vascular punctures. The femoral nerve catheter attached to the left leg in our case the preoperative period located on the femoral nerve, remained in the posttraumatic patient for 3 days and allowed us to follow the patient pain-free. The physiotherapist applied physical therapy movements painlessly. In our case, the catheter placed in the femoral nerve remained in the 34-year-old male patient for 3 days, allowing us to follow the patient pain-free. The physiotherapist applied physical therapy movements painlessly.

Keyword: femoral nerve catheter; pain, physiotherapy; quadricepsplasty

Introduction

Backgraund: Regional nerve blocks provide superior analgesia over opioid based pain management regimens for traumatic injuries such as femur fractures, Judet quadricepsplasty. An ultrasound-guided regional nerve block is placed either as a single-shot injection or via a perineural catheter that is left in place. Continuous peripheral nerve block is associated with some limitations, including infection, neurologic injury, local anesthetic toxicity, and patient falls. [1,2]. Perineural catheters allow prolonged and titratable delivery of local anesthetic directly targeted to the injured extremity, resulting in opioid sparing while maintaining high-quality pain relief with improved alertness. A catheter-over-needle kit, resembling a peripheral intravenous line, is now available. Recent studies also suggest excellent analgesic outcomes with intermittent perineural bolusing of local anesthetic, thereby dispensing with the need for complex and expensive infusion pumps. Our experience suggests that this is a promising new technique for emergency pain management of acute extremity injuries. Preparation included sterile gown, gloves, hat, mask, and drape. With the patient supine, the left femoral nerve is visualized just distal to the inguinal ligament and approximately 1 to 2 cm cephalad to the inguinal crease [1].

Presentation

34-year-old male patient Judet, who developed post-traumatic knee extension contracture, was followed for 32 months after quadricepsplasty (Picture 1). Knee extension contracture occurred especially in the patient with multiple fractures and supracondylar femur and patella fractures after the procedure. Normal walking requires a 70° bend at the knee during flexion and a 110° bend from sitting in a chair to standing. The catheter-over-needle apparatus is inserted lateral to medial and in-plane, with the needle tip passing through the fascia iliaca lateral to the femoral nerve and positioned just adjacent to the nerve. Successful nerve targeting is confirmed by visualizing local anesthetic spread deep to the femoral nerve (lifting the nerve upwards) but above the iliacus muscle. Once the needle tip is in position, the needle is withdrawn, leaving the outer catheter in place. The flexible inner catheter is then threaded into the perineural space, followed by an initial bolus of local anesthetic and then continuous infusion and/or repeat boluses, depending on the clinical circumstances. The catheter-over-needle technique that we describe here is less cumbersome than the traditional catheter techniques and which involve epidural-type catheters threaded through a Tuohy needle (catheter through needle). In contrast with an expected shorter and minimal learning curve due to its resemblance to common peripheral nerve lines [4,5].

Picture 1: Judet quadricepsplasty

Pictıre 2: Femoral nerve catheter

In summary, our experience suggests that the catheter unit is not only easy to place but also offers significantly greater flexibility to tailor and prolong analgesia depending on the clinical need with the added ability to pause dosing and allow block recovery for neurologic or compartment evaluation if desired. The perineural space is opened with a small bolus of local anesthetic that lifts the femoral nerve upwards. The femoral artery is visualized medial to the nerve. Ultrasound image of the introducer 18G cannula in place. The needle has been removed, and the flexible injection catheter has been threaded through the introducer cannula with its distal tip in the perineural space underneath the femoral nerve and above the iliacus muscle. Ultrasound-guided, in-plane, lateral approach to the femoral nerve. The secured perineural femoral catheter [6]. The entire apparatus is then covered with a transparent occlusive dressing and clearly labeled with an indelible marker to avoid being mistaken for an intravenous line. A 34-year-old male patient was admitted to our orthopedic clinic due to left quadriceps shortness and flexion limitation following a conservative patella fracture. Judet quadricepsplasty was planned and performed for the patient (Picture 1). In Judet quadricepsplasty, the intrinsic and extrinsic components that prevent knee flexion are released in a controlled and sequential manner, and the surgery is terminated when the desired degree of flexion is achieved [7]. The patient was subjected to general anesthesia for 3 hours (induction: 200 mg propofol, 40 mg rocuronium bromide, 200 mcg remifentany; maintenance: 40% O_2 and 60% air, intravenous remifentanil between 0.1-0.3 mcg/kg/min). 100 mg tramadol and 40 mg tenoksixam i.v were administered to the patient before waking up. However, when the patient woke up, the complaint of severe pain continued (VAS: 8). After informed consent was obtained, a perineural femoral catheter was placed and a 20 mL 0.25% bupivacaine bolus was first administered. VAS scores were 3/8 20 minutes after injection. When the pain returned after 8 hours, an additional 10 mL of 0.25% was injected through the catheter and the pain completely disappeared within 15 minutes. The third bolus of 10 mL 0.25% bupivacaine was applied 30 minutes before the daily physical therapy exercises on the second hospitalization, the fourth bolus of 10 mL 0.25% bupivacaine was applied 30 minutes before the on the third hospitalization before physical therapy movements. The catheter was removed on the third day hospitalization. Since a femoral catheter was inserted, the patient had the opportunity to receive painless physical therapy and all movement restrictions were eliminated. At the 6-month follow-up, the patient reported that he was satisfied with the procedure and had no neurological deficits. After the surgery, the patient's knee and hip were kept at 90 degrees of flexion. After 24 hours, the patient's hemovac drain was removed and passive knee movements were started immediately, accompanied by the femoral nerve catheter (Picture 2).

In the cases described here, sterility level was on par with that used for central venous catheter placement, and the catheter-over-needle design a short catheter already preloaded onto the needle rather than a long, cumbersome, epidural-type catheter should further minimize the risk of contamination [6]. This image shows the introducer needle (arrowheads) with the overriding 21G cannula being positioned underneath the fascia iliaca (dotted line) (picture 2). The perineural space is opened with a small bolus of local anesthetic that lifts the femoral nerve upwards.

The perineural space is opened with a small bolus of local anesthetic that lifts the femoral nerve upwards.

Conclusion: The catheter placed on the femoral nerve remained in the patient for 3 days and allowed us to follow the patient pain-free. The physiotherapist applied physical therapy movements painlessly. The postoperative results of the patient were evaluated according to the Judget classification. According to this classification, flexion of 100 degrees and above was considered very good, flexion of 80-50 degrees was considered moderate, and flexion of less than 50 degrees was considered poor [7]. Rehabilitation for at least 3 months in patients who will undergo quadricepsplasty positively affects the conscious surgery. In our cases, we performed rehabilitation for at least 3 months before surgery. At the last follow-up, our patient's quadriceps muscle strength was found to be full, and the patient's flexion was clear.

References

1. Beaudoin FL, Nagdev A, Merchant RC, Becker BM (2010). Ultrasound-guided femoral nerve blocks in elderly patients with hip fractures. *Am J Emerg Med* 2010;28(1): 76–81.
2. Mutty CE, Jensen EJ, Bone LB, et al (2007). Femoral nerve block for diaphyseal and distal femoral fractures in the emergency department. *J Bone Joint Surg Am* 2007;89(12): 2599–603.
3. Stewart B, Tudur Smith C, Low B, et al (2007). Emergency department use of a continuous femoral nerve block for pain relief for fractured femur in children. *Emerg Med J* 2007;24(2):113–4.
4. Ilfeld BM (2011). Continuous peripheral nerve blocks: a review of the published evidence. *Anesth Analg* 2011;113(4):904–25.
5. Hillegass MG, Field LC, Borckardt JJ, et al (2013). The efficacy of automated intermittent boluses for continuous femoral nerve block: a prospective, randomized comparison to continuous infusions. *J Clin Anesth* 2013;25(4):281–8.
6. Ip VH, Tsui BC (2012). Potential contamination of the surgical site caused by leakage from an interscalene catheter with the patient in a seated position: a case report. *Can J Anesth* 2012;59(12):1125–9
7. Luo Y, Li H, Mei L, Mao X (2021). Effects of Judet Quadricepsplasty in the Treatment of Post-Traumatic Extension Contracture of the Knee. *Orthop Surg*. 2021 Jun;13(4):1284-1289.