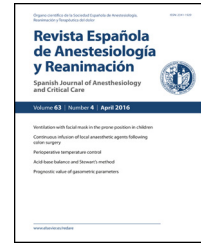




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## ORIGINAL ARTICLE

# Effectiveness and safety of continuous ultrasound-guided femoral nerve block versus epidural analgesia after total knee arthroplasty<sup>☆</sup>

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### KEYWORDS

Continuous femoral nerve block;  
Epidural analgesia;  
Ultrasound;  
Total knee arthroplasty;  
Levobupivacaine

### Abstract

**Objectives:** Total knee arthroplasty is associated with severe postoperative pain. The aim of this study was to compare continuous ultrasound-guided femoral nerve block with continuous epidural analgesia, both with low concentrations of local anaesthetic after total knee arthroplasty.

**Material and methods:** A prospective, randomised, unblinded study of 60 patients undergoing total knee replacement, randomised into two groups. A total of 30 patients received continuous epidural block, while the other 30 received continuous ultrasound-guided femoral nerve block, as well as using 0.125% levobupivacaine infusion in both groups. Differences in pain control, undesirable effects, and complications between the two techniques were assessed, as well as the need for opioid rescue and the level of satisfaction with the treatment received during the first 48 h after surgery.

**Results:** No differences were found in demographic and surgical variables. The quality of analgesia was similar in both groups, although in the first six hours after surgery, patients in the epidural group had less pain both at rest and with movement ( $p=0.007$  and  $p=0.011$ ). This difference was not observed at 24 h ( $p=0.084$  and  $p=0.942$ ). Pain control at rest in the femoral block group was better at 48 h after surgery than in the epidural group ( $p=0.009$ ). The mean consumption of morphine and level of satisfaction were similar. Epidural analgesia showed the highest rate of side effects ( $p=0.003$ ).

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**PALABRAS CLAVE**

Bloqueo femoral continuo;  
 Analgesia epidural;  
 Ecografía;  
 Artroplastia total de rodilla;  
 Levobupivacaína

**Conclusions:** Continuous ultrasound-guided femoral nerve block provides analgesia and morphine consumption similar to epidural analgesia, with the same level of satisfaction, but with a lower rate of side effects after total knee arthroplasty.

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## Eficacia y seguridad del bloqueo femoral continuo guiado con ecografía frente a la analgesia epidural en el postoperatorio de artroplastia total de rodilla

**Resumen**

**Objetivos:** La artroplastia total de rodilla es una intervención asociada a dolor postoperatorio de severa intensidad. El objetivo de este estudio fue comparar el bloqueo continuo del nervio femoral ecoguiado con la analgesia epidural continua, ambos con bajas concentraciones de anestésico local en el postoperatorio inmediato de este proceso.

**Material y métodos:** Estudio prospectivo aleatorizado no enmascarado de 60 pacientes intervenidos de prótesis total de rodilla aleatorizados en 2 grupos. Treinta pacientes recibieron un bloqueo epidural continuo mientras que los otros 30 recibieron un bloqueo continuo del nervio femoral ecoguiado, utilizando para la infusión levobupivacaína 0,125% en ambos grupos. Se valoró la existencia de diferencias en cuanto al control del dolor, la aparición de efectos colaterales y complicaciones entre ambas técnicas, así como la necesidad de opiáceos de rescate y el grado de satisfacción con el tratamiento recibido durante las primeras 48 h de postoperatorio.

**Resultados:** La calidad de la analgesia fue similar en ambos grupos, aunque en las primeras 6 h de postoperatorio los pacientes del grupo epidural presentaron menor dolor tanto en reposo como en movimiento ( $p=0,007$  y  $p=0,011$ ). Esta diferencia no se observó a las 24 h ( $p=0,084$  y  $p=0,942$ ). A las 48 h el control del dolor en reposo en el grupo bloqueo femoral fue mejor que en el epidural ( $p=0,009$ ). El consumo medio de morfina y el grado de satisfacción fueron similares. La analgesia epidural presentó el mayor índice de efectos colaterales ( $p=0,003$ ).

**Conclusiones:** El bloqueo continuo del nervio femoral ecoguiado proporciona una analgesia y un consumo de morfina similares a la analgesia epidural, con un mismo grado de satisfacción pero con menor índice de efectos colaterales en el postoperatorio de artroplastia total de rodilla.

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**Introduction**

Total knee arthroplasty (TKA) is one of the most common procedures in orthopaedic surgery. This intervention is associated with acute moderate to severe postoperative pain in the first 24–72 h, and can affect the patient's daily activities such as sleep, appetite, ambulation, concentration and mood.<sup>1</sup> Untreated acute postoperative pain is also accompanied by medical complications, longer hospital stay and elevated costs.<sup>2</sup> Current therapy for acute postoperative pain after TKA is based on a multimodal system which combines drug regimens with locoregional techniques such as peripheral nerve block.<sup>3</sup> For decades, different techniques and approaches to peripheral nerve block have been put forward, but the addition of ultrasound guidance has led to the development of increasingly effective and safe techniques in recent years. Using ultrasound to guide the placement of perineural catheters improves accuracy of delivery<sup>4,5</sup> and increases the success rate (90–95%) without increasing the risks.<sup>6</sup>

In this study, we compared ultrasound-guided femoral block with continuous epidural block in terms of pain

management, need for rescue opioids, incidence of side effects and complications, and patient satisfaction in the context of postoperative care of primary unilateral TKA.

**Materials and methods**

Prospective randomised unblinded study of patients undergoing unilateral primary total knee arthroplasty between 2013 and 2014. After obtaining the approval of the hospital's Ethics Committee and informed consent from study patients, 60 patients with clinical status I–III according to the American Society of Anaesthesiologists (ASA), were randomised into 2 groups using a computer-generated list. A third party placed each number in a sealed envelope and asked patients to choose an envelope before the procedure. Patients in the EPI group received continuous epidural analgesia, while those in the CFNB group received continuous ultrasound-guided femoral nerve block.

Exclusion criteria were: age under 18 and/or over 90 years, ASA IV, allergy to or intolerance to study drugs, contraindication for regional anaesthesia (localised infection,

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