

ORIGINAL ARTICLE

# Home-based intravenous analgesia with elastomeric pump as an outpatient procedure for pain control after anterior cruciate ligament repair<sup>☆</sup>



J. Villalba<sup>a,\*</sup>, J. Peñalver<sup>a</sup>, P. Torner<sup>a</sup>, M. Serra<sup>b</sup>, J. Planell<sup>b</sup>

<sup>a</sup> Corporación Sanitaria Parc Taulí, Servicio de Cirugía Ortopédica y Traumatología, Hospital de Sabadell, Institut Universitari Parc Taulí, Universitat Autònoma de Barcelona, Sabadell, Spain

<sup>b</sup> Corporación Sanitària Parc Taulí, Servicio de Anestesiología, Hospital de Sabadell, Institut Universitari Parc Taulí, Universitat Autònoma de Barcelona, Sabadell, Spain

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## KEYWORDS

Anterior cruciate  
ligament;  
Outpatient  
treatment;  
Elastomeric pump

## Abstract

**Objective:** To follow up pain in the immediate postoperative period, using an elastomeric pump in anterior cruciate ligament surgery.

**Material and methods:** 309 patients who had undergone anterior cruciate ligament repair with bone-tendon-bone allograft. Pain control was assessed with a visual analogue scale (VAS) during the immediate postoperative period, in the postoperative care unit, in the recovery room, and after the first 24–48–72 h following home discharge. The need for rescue medication, adverse effects observed and emergency visits were also registered.

**Results:** 309 patients were assessed (264 males, 45 females), mean age 33 (range: 18–55). Postoperative pain was mild in 44.7% of patients, and 38.5% were pain-free. At discharge, 41.1% of patients reported mild pain and 57% were pain-free. At home, mild to moderate levels of pain were maintained and over 97% of patients presented VAS values  $\leq 3$ . Fewer than 3% had adverse effects, 8.7% had to use analgesic medication at some point. Pruritus occurred in less than 1% of patients receiving intravenous analgesia at home, and fewer than 2% had device-related complications.

**Discussion:** There is no consensus regarding the postoperative management of anterior cruciate ligament lesions, although most surgeons use multimode anaesthesia and different combinations of analgesics to reduce postoperative pain.

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\* Corresponding author.

E-mail address: [jvillalba@tauli.cat](mailto:jvillalba@tauli.cat) (J. Villalba).

**PALABRAS CLAVE**

Ligamento cruzado anterior;  
Tratamiento ambulatorio;  
Bomba elastomérica

**Conclusions:** The use of an intravenous elastomeric pump as postoperative analgesia for anterior cruciate ligamentoplasty has yielded good results.

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### Analgesia intravenosa domiciliaria mediante bomba elastomérica como procedimiento ambulatorio de control del dolor en la reparación del ligamento cruzado anterior

**Resumen**

**Objetivo:** Hacer un seguimiento del dolor en el posoperatorio inmediato, mediante el uso de bomba elastomérica en la cirugía del ligamento cruzado anterior (LCA).

**Material y métodos:** Trescientos nueve pacientes intervenidos de ligamentoplastia del LCA mediante plastia autóloga de hueso-tendón-hueso. Durante el posoperatorio inmediato se realizó un seguimiento del dolor mediante escala visual analógica (EVA); tanto en la unidad de reanimación posoperatoria, como en la sala de adaptación al medio, y durante las primeras 24–48–72 h en el domicilio. Registramos también la necesidad de medicación de rescate, efectos adversos observados y visitas al servicio de urgencias.

**Resultados:** Se estudió a 309 pacientes (264 varones, 45 mujeres) con una edad media de 33 años (rango: 18–55). El 44,7% de los pacientes reportaron dolor posoperatorio inmediato leve y el 38,5% no tenía dolor. Al alta, el 41,1% de los pacientes reportaron dolor leve y el 57% no tenía dolor. En domicilio, se mantuvieron los valores de dolor leve/moderado, con más del 97% de los pacientes con valores EVA  $\leq 3$ . Se registraron efectos adversos en menos del 3% de los casos. El 8,7% de los casos tuvo que hacer uso en algún momento de medicación analgésica. Menos del 1% presentó prurito mientras llevaban la analgesia intravenosa en el domicilio y menos del 2% presentó problemas relacionados con el dispositivo.

**Discusión:** Actualmente, no hay consenso en cuanto al manejo posoperatorio de las lesiones del LCA, aunque la tendencia es el uso de anestesia multimodal y de sistemas para reducir el dolor posoperatorio.

**Conclusiones:** El uso de bomba elastomérica como procedimiento ambulatorio de control del dolor en la reparación del ligamento cruzado anterior ha reportado buenos resultados.

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**Introduction**

Anterior cruciate ligament (ACL) surgery is a common procedure, particularly in arthroscopic treatment. Good postoperative pain control is very important for good rehabilitation and satisfactory final functional outcomes. Even so, more than 60% of patients who undergo this surgery experience moderate to severe pain with conventional oral analgesic regimens,<sup>1</sup> such as alternating paracetamol with nonsteroidal anti-inflammatory drugs, plus a rescue drug like tramadol.<sup>2,3</sup>

This operation is currently increasingly being undertaken in the form of day-case surgery.<sup>2,4</sup> There are many studies that have demonstrated that outpatient ACL surgery is safe and effective, and with good pain control there is no increase in the need for rehospitalisation and/or complications.<sup>2,5</sup>

Most of the published articles present the circuits that these patients undergo when they receive nerve block analgesia by infusion on discharge.<sup>6,7</sup>

The Spanish Association of Major Ambulatory Surgery (*Asociación Española de Cirugía Mayor Ambulatoria*) (ASECMA) underwrite a decologue, which is the first

consensus document endorsed by other medical and surgical societies, and indicate that a multidisciplinary, multimodal and individualised approach should be taken to pain.<sup>4</sup> The advent of elastomeric infusers, and drug infusion pumps have proved a major advance in the administration of all sorts of drugs for the treatment of postoperative pain. Maintenance of stable plasma levels have resulted in better pain control, improved efficacy and reduced side effects compared with the administration of bolus medication.<sup>2</sup>

The objective of this study was to present the results of the pain control and complications protocol that we use in our centre, for patients who undergo arthroscopic ACL reconstruction as day cases in our department and receive postoperative pain control through a continuous intravenous infusion pump (elastomeric pumps).

**Material and methods**

A retrospective study was undertaken of a consecutive series from 2009 to 2015, which included 309 patients who had undergone ACL ligamentoplasty with bone-tendon-bone (BTB) autologous plasty. The BTB allograft technique was employed for reconstruction of the ACL. The anaesthetic

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