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Changing from epidurals to femoral nerve catheters for postoperative analgesia following total knee arthroplasty: Analysis of efficacy versus nurse perception

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KEYWORDS

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Abstract A retrospective review and survey was performed to evaluate a new protocol for postoperative pain control in patients undergoing total knee arthroplasty (TKA). The goal of the new protocol was to improve postoperative pain control, decrease side effects and facilitate participation in physical therapy. Previously, patients received an epidural infusion overnight ($n = 130$). With the new protocol, patients received a femoral nerve catheter (FNC) infusion until the morning of postoperative day two (POD2) ($n = 170$). Both groups received a combination of oral and intravenous analgesics. The FNC group was able to ambulate further, and was more likely to participate in physical therapy on the day of surgery. Patients in the FNC group also reported less pain, nausea and pruritis. Length of stay was not impacted on. Patients with an epidural required less opioid on the day of surgery but, there was no difference in opioid consumption compared through POD2. A survey was administered to nurses in the post anesthesia care unit and the orthopedic ward to investigate perceptions about the new protocol. The results of the survey demonstrated that although the change was effective, sufficient staff education is an important component of staff perceptions and implementing a change in practice. © 2014 Published by Elsevier Ltd.

Background

Achieving good pain control following total knee arthroplasty (TKA) is essential in ensuring optimal patient outcomes (Choi et al., 2003). Poorly

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Editor comments

Pain management following elective orthopedic surgery remains a major challenge and is arguably the most significant postoperative care issue once the initial physiological recovery from surgery has been achieved. Much development is currently focussed on analgesic practices that begin in the perioperative period and last into the first few days following surgery. This paper describes how local practice development can be carefully evaluated to provide practitioners with evidence of the impact of different approaches to pain management in terms of improvement in patient pain outcomes. Papers which share practice innovations such as this are of great value to the orthopedic practice community.

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controlled pain is associated with failure to meet therapy goals and may lead to other medical complications related to a lack of mobility (Davies et al., 2004).

While epidural analgesia for TKA offers excellent postoperative pain control, the technique is associated with potential disadvantages. Epidural analgesia may cause bilateral lower extremity weakness, therefore complicating attempts at early physical therapy. Lumbar epidural analgesia is also associated with the need for urinary catheterization, a risk factor for developing urinary tract infections (Baldini et al., 2009; Stamm, 1991; Stephan et al., 2006). Postoperative bladder catheterization increases the risk of subsequent joint infections (Koulouvaris et al., 2009; Minnema et al., 2004; Maderazo et al., 1988). In addition, the introduction of new and more potent anticoagulants, frequently used following knee arthroplasty to prevent postoperative thrombophlebitis has reduced the safety of concurrent epidural analgesia (Schroeder, 1998; Checketts, 2009).

While epidural analgesia provides complete lower extremity pain control, femoral nerve blockade provides analgesia only to the anterior thigh, majority of the femur and knee joint and the medial aspect of the leg below the knee (New York School of Regional Anesthesia, 2009). In contrast with an epidural, analgesia with a continuous femoral nerve block preserves the strength of the contralateral and ipsilateral posterior leg, potentially allowing for earlier participation in physical therapy. In addition, there is no need for bladder catheterization so the risk of urinary tract infection is decreased. Continuous femoral nerve blockade can be performed on patients who are receiving low molecular weight heparin (LMWH) and other anticoagulants for thrombosis prophylaxis (Zaric et al., 2006). Neurological complications related to peripheral nerve blockade have also been shown to be less severe than those potentially encountered with epidural catheterization (Fowler et al., 2008; Fanelli et al., 1999).

When choosing between a femoral nerve catheter (FNC) and an epidural, careful consideration should be given to the potential benefits as well as potential complications or side effects. Several studies have demonstrated equivalent pain control between epidurals and peripheral nerve blocks (Zaric et al., 2006; Capdevila et al., 1999) while others have reported improved pain control with peripheral nerve blocks for TKA (Macfarlane et al., 2009). An additional benefit of peripheral nerve blockade is a significant decrease in side effects. Epidurals are associated with higher rates of urinary retention, dizziness, sedation, pruritus, nausea, vomiting, catheter displacement and bilateral spread of analgesia versus peripheral nerve catheters (Lorenzini et al., 2002; Forster and Rosenberg, 2004). Most studies compare patients who have received a regional technique, either a peripheral nerve block or epidural, to a general anesthetic with postoperative opioid-only analgesia. There are currently no published studies that have evaluated an epidural overnight versus a femoral nerve catheter for 48 h of postoperative analgesia.

Prior to Spring 2011, patients undergoing total knee arthroplasty at the University of Wisconsin Hospital routinely received an epidural infusion continued overnight for postoperative analgesia. In February 2011 a new protocol was initiated for all patients undergoing TKA. This new pain initiative attempted to improve postoperative pain control, decrease side effects and facilitate physical therapy participation, allowing for a reduced length of stay. The new protocol included a continuous femoral nerve catheter that was utilized for 48 h postoperatively, or until patient discharge, whichever was shorter. In-service education about femoral nerve catheters and the specifics of the new protocol were provided to all registered nurses on the orthopedic ward, the orthopedic pharmacists, the orthopedic physical therapists, and to the orthopedic residents by the Anesthesia Pain Service prior to implementation of the new protocol. The education included information on

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