Nurse-administered femoral nerve block after hip fracture

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Hip fracture is a common injury that predominantly affects older people. Pain following fracture of the neck of the femur is present throughout the illness trajectory, including the preoperative and postoperative periods. This article describes how nurses at one trust implemented an innovative nurse-administered femoral nerve block service.

Mortality and morbidity after hip fracture are high and, as a result, a number of professional bodies and government initiatives have targeted these vulnerable patients (Royal College of Physicians, 1989; Audit Commission, 1995; Todd et al, 1995). The NHS Fractured Neck of Femur Collaborative (NHS Modernisation Agency, 2001) encouraged trusts throughout the UK to share best practices in a range of process measures and service improvements, including pain management. The collaborative adopted the suggestion by Counsell (2000) that, in the absence of a nationally agreed pain scoring system, a score above 50 per cent on the pain scale at two or more hourly recordings in the first 24 hours constitutes a failure of analgesia. The standard of care agreed by the collaborative was that a pain score should never exceed 50 per cent.

This article describes how Queen’s Medical Centre NHS Trust in Nottingham, which treats more than 700 hip fracture patients a year (Wenn and Moran, 2003), chose to meet this standard through a nurse-administered femoral nerve block service.

**Drivers for change**

Pain following fractured neck of femur is present throughout the illness trajectory, including the preoperative and postoperative periods. Most patients experience severe pain on movement (Roberts and Eastwood, 1994), yet pain may be absent at rest, thus contributing to inadequate analgesic dosing. Prescribed analgesics are not always administered by nurses and there is little use of adjuvant therapy (Morgan-Jones, 1996).

Evidence suggests that pain can influence outcome after surgery for a fractured hip. Higher pain scores after surgery may be associated with increased length of stay, delayed ambulation and increased postoperative complications (Morrison et al, 2003). While increasing age, poor mental health and high pain severity scores on movement adversely affect functional outcomes postoperatively, pain severity scores are the only variable that can be manipulated (Feldt and Oh, 2000).

Pain management for this vulnerable group of patients is particularly challenging. Multiple co-morbidities, polypharmacy and altered pharmacokinetics can limit the range of suitable analgesics. A significant number of patients have cognitive impairment, either as a result of dementia or acute confusion related to hospital admission, injury or surgery (Wong et al, 2002), which may prevent them from requesting painkillers or accepting them when offered. Older people often hold exaggerated beliefs about the addictive properties of morphine and staff misconceptions regarding pain perception and ageing may also contribute to inadequate prescribing or administration of analgesia (Wilson, 2000).

A number of studies support the use of femoral nerve block for pain relief in A&E after fractured neck of femur, reporting fast and effective analgesia in the majority of cases (Finlayson and Underhill, 1988; Stella et al, 2000) with a reduction in morphine consumption when compared with controls (Haddad and Williams, 1995; Fletcher et al, 2003). This results in longer-lasting and more consistent analgesia, with a reduced risk of the sedation that can accompany morphine administration.

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**REFERENCES**


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**FIG 1. MODERATE/SEVERE PAIN BEFORE AND AFTER NERVE BLOCK**

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<thead>
<tr>
<th>Pain at rest</th>
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<td>No of patients</td>
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<tr>
<td>Before block</td>
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**TABLE**

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As a result, femoral nerve block is gaining support as the ‘gold standard’ analgesic technique following hip fracture (Martin and Ali, 2002; NHS Modernisation Agency, 2001; Parker, 2000).

**Femoral nerve block**

The hip is in part innervated by the femoral nerve, which runs between the psoas major and the iliacus muscles. An injection of local anaesthetic close to the nerve inhibits sodium from entering the nerve cells, preventing depolarisation. Transmission of painful sensations along the nerve is blocked, in addition to motor innervation to the thigh and knee.

Potential complications include inadvertent intravascular injection, haematoma and nerve injury. Complications relating to the local anaesthetic include hypotension and toxicity. Motor block of the affected limb is common.

**Implementation**

To help attain the standard of care set by the NHS collaborative (NHS Modernisation Agency, 2001), there was a joint initiative by the Trauma and Orthopaedic Directorate and pain management service. An advanced nurse practitioner was seconded to the pain management service to develop a unique nurse-led preoperative femoral nerve block service and to provide education to nurses regarding pain management after hip fracture. Dedicated financial support was not available so alternative funds were used to supplement the project.

During the initial phase the advanced nurse practitioner undertook a risk assessment from which a competency framework, clinical procedure and patient group direction for the administration of local anaesthetic via femoral nerve block were developed. The advanced knowledge and skills required to undertake this procedure include a comprehensive knowledge of the regional anatomy of the lower limb and femoral nerve, pharmacology of local anaesthetics, utilising the appropriate equipment, assessing the patient’s suitability, performing the block safely and competently and providing appropriate aftercare. These were gained during the second phase of the project through supervised practice of 10 patients. The final phase involved delivering and evaluating the service.

**Evaluation**

Ninety-six patients were admitted for surgery following fractured neck of femur between January and March 2004. Oral analgesia was commenced on arrival, typically 1g paracetamol four times daily with 30–60mg dihydrocodeine (maximum daily dose 240mg). Sixteen patients (17 per cent) provided written consent for nurse-administered femoral nerve block for preoperative pain. Patients were asked to rate their pain as none, mild, moderate or severe before the administration of 20ml 0.25 per cent levobupivacaine and, again, one hour later. No additional oral analgesia was given during this time.

Most patients benefited from improved analgesia. Before the nerve block, seven patients reported moderate or severe pain at rest, while all 16 reported moderate or severe pain on movement. Following femoral nerve block, only one patient reported moderate pain at rest although eight remained in moderate or severe pain on movement (Fig 1). Three patients reported the same pain scores before and after the nerve block, but two acknowledged that their pain had improved. All three patients had an extracapsular fracture.

None of the patients showed signs of hypotension, local anaesthetic toxicity, haematoma, localised infection or nerve damage at one or 24 hours following femoral nerve block. Motor block was elicited in 12 patients, including those whose pain scores remained unchanged after the nerve block.

Patients were invited to make comments about their analgesia. Six reported excellent pain relief, while two commented that the motor block was disturbing and would deter them from agreeing to the procedure again.

Although the duration of the nerve block could not be formally evaluated, patients reported several hours of pain relief. Two patients commented that it did not last long enough. Qualitative statements are summarised in Table 1.

**REFERENCES**


Discussion

This project concurs with empirical studies that report a similar reduction but not abolition of pain (Haddad and Williams, 1995; Fletcher et al, 2003). The absence of adverse effects demonstrates that femoral nerve block can be safely performed by an advanced nurse practitioner. The quality and duration of analgesia might have been improved by utilising a stronger concentration of local anaesthetic. Alternatively, the placement of a femoral nerve sheath catheter would provide a continuous infuson of anaesthetic. This could be of particular benefit to patients whose surgery is delayed.

Only 17 per cent of patients consented to the nurse-administered femoral nerve block (Fig 2). Of those who declined, 18 per cent stated that their pain was not sufficiently troublesome to warrant it, while the remainder expressed concerns about agreeing to a novel service. Other patients may have benefited from the procedure, but were not afforded the choice – 30 per cent were admitted outside service hours and had already undergone surgery or their surgery was imminent when the advanced nurse practitioner visited the trauma wards. Some of these may have benefited from improved preoperative analgesia had the service been more accessible. Further attempts to secure recurrent funding should advocate extending the service hours to seven days a week with out-of-hours provision. This could be achieved by expanding the number of acute pain nurses in the trust and cascading the training to the whole team.

As the service was a pilot project, it was appropriate that written consent for the nerve block should be sought. Unfortunately, this resulted in the exclusion of patients with cognitive impairment (26 per cent). The underadministration of analgesia to cognitively impaired patients with femoral neck fractures is well documented (Forster et al, 2000; Morrison and Siu, 2000), yet these patients are a particularly vulnerable group who are often unable to express their pain or request painkillers. They may benefit from a femoral nerve block due to its long-lasting effects, few side-effects and potential to abolish pain completely.

Restraining factors

A number of factors restrained development of the service. It had been originally intended that the advanced nurse practitioner would gain experience in administering femoral nerve blocks to patients requiring the procedure for chronic pain of the hip or knee under the supervision of a consultant anaesthetist. However, because few patients required the procedure and because of increased demands on the time of the clinical supervisor, an alternative patient group was sought. As a result, a significant delay occurred in identifying suitable mentors to facilitate supervised practice.

As this was a pilot project, it did not attract dedicated funding. Subsequently, the advanced nurse practitioner was employed on a part-time basis and this restricted opportunities to engage in supervised practice, which in tum delayed achievement of clinical competence. Ultimately, failure to secure recurrent monies for the continuation and development of the service led to its withdrawal. A bid for funding has since been submitted to the local health communities and a decision is awaited.

Conclusion

This article demonstrates that the administration of femoral nerve block after hip fracture is safe and provides clear and demonstrable benefits to patients. Optimising analgesia may also improve postoperative outcomes and return potential cost savings. In order to ensure that the greatest numbers of patients benefit from a femoral nerve block, a nurse-led service should be available around the clock, including to those with cognitive impairment. Femoral nerve blockade should form part of an integrated care pathway, supported by advanced nurse practitioners to ensure timely, appropriate, effective and equitable provision of analgesia to all vulnerable patients with a fractured neck of femur.