

A comparison of the analgesic effects of femoral nerve block and intra-articular bupivacaine in day case operative knee arthroscopy

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Abstract

A double blind prospective study of 50 patients undergoing operative day case knee arthroscopy was performed. Each patient received either intra-articular bupivacaine or a femoral nerve block (FNB) after the operative procedure. Pain scores were recorded pre- and post-operatively at rest and found to be reduced in the FNB group. Time to first dose of analgesia was also prolonged in the FNB group. No major complications were recorded and no patient required overnight stay. © 1998 Elsevier Science B.V. All rights reserved.

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1. Introduction

Knee arthroscopy is an accepted day case procedure. The success of day case surgery is partly dependent on the control of post-operative pain. Intra-articular local anaesthetic with or without an opioid is frequently used to reduce post-operative pain [1,2]. However, a recent study by Laurent et al. showed no increased analgesic effect by the addition of morphine to intra-articular bupivacaine [3].

In this study the analgesic effects of intra-articular bupivacaine are compared with a femoral nerve block (FNB). Only patients undergoing operative knee arthroscopy were included. All operations were performed by one consultant surgeon or one of his team. The same consultant anaesthetist was involved throughout the study and performed all the FNB's.

2. Method

A double blind, randomised study was performed on 50 patients undergoing operative day case knee arthroscopy at Kingston Day Case Unit. Written informed consent was obtained from each patient.

All patients had a general anaesthetic and either received intra-articular bupivacaine (20 mls of 0.5%) or a FNB (20 mls of 0.5%) at the end of the operative procedure. Neither the patient or operating surgeon were aware of the type of analgesia used.

Twenty five patients were randomised to receive a FNB. This was administered by the same consultant anaesthetist with the aid of a nerve stimulator. Twenty five patients received intra-articular bupivacaine.

Pain scores were recorded pre and post-operatively at rest using a visual analogue scale (0 to 100 mm). Pain scores were recorded at 1 and 4 h after operation in the day unit, and at 12 and 24 h at home. Co-dydramol was prescribed to each patient to take home and use as required.

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Figure 1 - Patient Data

	FNB	Intra-Articular Bupivacaine
Meniscectomy	20	17
Debridement	5	7
Synovial Biopsy	-	1
Age (Mean)	38	41
Sex (M : F)	19 : 6	17 : 8

Fig. 1. Patient data.

The patients were phoned the next day to record pain scores, time to first dose of oral analgesia, and to ascertain patient satisfaction and the presence of numbness or heaviness in the leg.

3. Results

3.1. Patient data

Fifty patients were included in the study, with an equal number either receiving intra-articular bupivacaine or FNB. The mean age and sex difference were similar in both groups (Fig. 1).

3.2. Pain scores

Mean pain scores using the visual analogue scale were compared between the two groups (Fig. 2).

Mean pain scores were less in the FNB group, with statistical significance at 4 and 12 h post-operatively using the paired *t*-test ($P < 0.05$). There was no statistical difference at 1 and 24 h.

3.3. Time to first dose of oral analgesia

The mean time to first dose of oral analgesia was prolonged in the FNB group (10 h) compared to the other group (6 h).

3.4. Patient satisfaction

In both groups the majority of patients were satisfied with post-operative analgesia (92% in FNB group and 88% with intra-articular bupivacaine). A total of 92% after direct questioning had numbness and heaviness in the operated leg in the FNB group, consistent with femoral nerve blockade.

3.5. Post-operative complications

No post-operative complications were recorded in either group.

Figure 2 - Mean Pain Scores

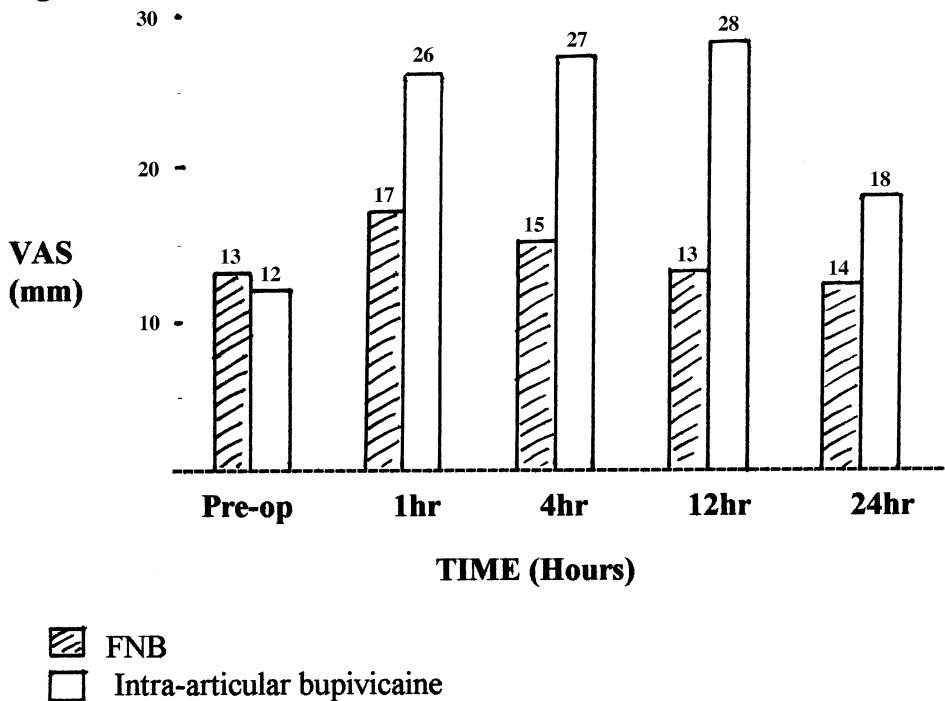


Fig. 2. Mean pain scores.

4. Discussion

Intra-articular bupivacaine is frequently used for post-operative analgesia in day case knee arthroscopy [1,2]. To our knowledge the use of a FNB in day case arthroscopy has not been compared with intra-articular local anaesthetic in patients undergoing general anaesthesia.

Mean pain scores were shown to be lower in the FNB group, and statistical significance shown at 4 and 12 h post-operatively. The time to first dose of oral analgesia was also prolonged in this group, which may possibly be a more sensitive indicator of post-operative analgesia [4].

In both groups a large number of patients were satisfied with post-operative analgesia. A total of 92% of patients with an FNB recorded heaviness and numbness in the operated leg after direct questioning. This corresponded to a successful FNB with quadriceps paralysis and numbness in the sensory distribution of the femoral nerve.

Prolonged motor weakness for up to 36 h has been recorded by Madej et al. [5], after femoral nerve blockade, but there were no cases of prolonged block in our series. A possible cause for this is intra-neural injection of local anaesthetic.

5. Conclusion

Both groups in our study recorded satisfaction

with post-operative analgesia after day case knee arthroscopy procedures. Advantages in the FNB group included lower mean pain scores and prolonged time to oral dose of analgesia. Disadvantages included symptoms of heaviness and numbness in the operated leg. All patients in the FNB group were able to mobilise and were discharged within a few hours of operation.

With the increasing use of our day case unit for lower limb operative procedures, the use of femoral nerve blockade may have potential in more invasive knee procedures, including arthroscopic anterior cruciate ligament reconstruction.

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