Is epidural anaesthesia acceptable at total hip arthroplasty?

A STUDY OF THE RATES OF URINARY CATHETERISATION

Regional anaesthesia is increasingly used in total hip arthroplasty (THA). Epidural anaesthesia has been shown to be safe in THA and may be used with or without an accompanying general anaesthetic. The advantages include protection against post-operative deep-vein thrombosis and a reduction in operative blood loss.

Urinary catheterisation may increase the incidence of deep infection of the hip in THA. We have studied the rate of urinary catheterisation prospectively in 177 patients who underwent a primary THA. We compared the rate in those who received general anaesthesia alone with that in patients who had general anaesthesia combined with local and opiate epidural injection.

Patients and Methods

We studied 177 primary THAs which were performed by, or under the supervision of the senior author (RNV). The data were gathered prospectively and the notes checked retrospectively to ensure validity.

We studied two groups, namely patients who received general anaesthesia alone and those who had both a general anaesthetic and combined local and opiate epidural injection. The choice of anaesthetic was made by the anaesthetist who was unaware of our study. The epidural agents used were a local anaesthetic (bupivacaine 0.25% to 0.5%, between 10 and 30 ml) with added opiate (50 to 100 µg of fentanyl). Four patients with pre-operative indwelling urinary catheters were excluded from the study, leaving 173.

Seventy-five patients had general anaesthesia alone, of whom 29 were men with a mean age of 65.7 years (39 to 85) and 46 were women with a mean age of 63.6 years (21 to 83). Ninety-eight patients had general, local and opiate epidural anaesthesia, of whom 46 were men with a mean age of 65.9 years (24 to 84), and 52 were women with a mean age of 64.9 years (30 to 86). Ten patients had bilateral arthroplasties during the study performed as two separate procedures. Each hip was included in our study as a separate case. There were no simultaneous bilateral arthroplasties.

All the patients were anaesthetised, intubated and ventilated in the anaesthetic room. Those who received an epidural anaesthetic were turned to the lateral position and an epidural catheter inserted in the L3/4 or L4/5 interspace. A single injection of bupivacaine 0.25% to 0.5% with added fentanyl (50 to 100 µg) was given. The blood pressure was maintained with intravenous fluids and ephedrine if required. There were no episodes of marked hypotension. The epidural catheter was removed in the recovery room before the patient returned to the ward.

The indication for post-operative catheterisation was urinary retention associated with distress. This diagnosis was made by the senior house officer on duty.
Statistical analysis. This was performed using a chi-squared test. A p value of <0.05 was regarded as being significant.

Results
Table I gives details of the results. The post-operative rate of urinary catheterisation was 14.7% for the group which received general anaesthesia alone compared with 13.3% for the group which had combined anaesthesia. There was no significant difference (p > 0.1).

Catheterisation was required in five (17.2%) of the 29 men who had general anaesthesia alone and in five (10.9%) of the 46 who had general and epidural anaesthesia (p > 0.1). In women it was required in six (13%) of the 46 who had general anaesthesia alone and in eight (15.4%) of the 52 who had general and epidural anaesthesia (p > 0.1).

There was no statistical significance between the rates of catheterisation for those with combined anaesthesia and those who received general anaesthesia alone in both men and women.

Discussion
Epidural injection has both anaesthetic and surgical advantages over general anaesthesia alone. These include a reduced incidence of post-operative deep-vein thrombosis, less intra-operative blood loss and excellent post-operative analgesia.

Bupivacaine, as the sole epidural agent, has a duration of surgical analgesia of approximately 200 minutes. This may be a conservative estimate. Epidural opiates can further increase the duration of analgesia into the post-operative period.

We wished to determine whether or not epidural anaesthesia, using a single injection of local anaesthetic and opiate, increased the rate of urinary retention in patients undergoing primary THA, thus increasing the potential for prosthetic infection. Our findings indicated that this was not so and we therefore conclude that peri-operative epidural anaesthesia using these agents is not a risk factor for infection after THA.

The only direct comparison of general and local epidural anaesthesia in THA was by Williams et al. They showed a rate of catheterisation of 12% in men who received general anaesthesia alone compared with 67% in those who received general and local epidural anaesthesia. The corresponding rates for women were 23% and 30%, respectively. They did not use epidural opiate, although the epidural catheter was left in situ for 12 to 24 hours after operation.

Other studies have shown that general anaesthesia gives a similar rate of catheterisation to that for general and local epidural anaesthesia. It has been suggested that use of supplementary epidural opiate increases the rate of catheterisation. Reiz et al showed an increase in the rate from 0%, when local and epidural anaesthesia was used, to 20% when epidural morphine was added at the end of the operation to enhance analgesia. Walts et al studied the factors which predisposed to urinary retention in patients who had THA and reported a rate of catheterisation of 21% in patients who received local and epidural anaesthesia. There was no significant difference from the rate observed with general anaesthesia alone. However, the administration of a single dose of epidural morphine at the end of surgery increased the rate of catheterisation to 62%.

Prolonged post-operative epidural analgesia has been associated with urinary retention. Gedney and Liu showed an overall rate of urinary retention of 53% when giving an epidural infusion of bupivacaine and opiate for 48 hours after total hip and knee arthroplasty.

In our study epidural anaesthesia with a pre-operative injection of bupivacaine and fentanyl did not increase the rate of catheterisation. Our anaesthetic technique differed from that of Williams et al and Gedney and Liu in that we used the epidural only during surgery, and from that of Reiz et al and Walts et al in that fentanyl rather than morphine was used and the opiate was given before rather than at the end of surgery.

We conclude that a peri-operative combination of bupivacaine and fentanyl as an epidural anaesthetic does not increase the rate of urinary catheterisation.

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References


