

NEW ANESTHESIA PROCEDURE DURING TVT SURGERY: MOTOR NERVE PRESERVATION WITH SPINAL ANESTHESIA USING LOW-DOSE BUPIVACAINE

Aims of Study

In the case of tension-free vaginal tape (TVT) surgery, muscle strength is required for obtaining an adequate increase in abdominal pressure when conducting a stress test by coughing during the procedure. Consequently, although the procedure is frequently performed under local infiltration anesthesia, this requires the use of a large amount of local anesthetic. We employ the use of spinal anesthesia using a low dose of bupivacaine that allows the obtaining of reliable analgesic effects while minimizing motor blocking. When low-dose bupivacaine at a concentration of one-half to one-fourth the normal dose is used for spinal anesthesia, motor blocking has been reported to be only mild despite adequate sensory blocking, indicating dissociation between sensory and motor anesthetic depth. This study was conducted for the purpose of assessing the usefulness of this new anesthesia technique in its application to TVT surgery.

Methods

This study was conducted on a total of 25 patients with stress urinary incontinence who underwent TVT surgery with spinal anesthesia by low-dose bupivacaine from January 2001 to March 2003. The average age of the patients was 56 years old (41-75 years old), and concomitant surgery consisted of 4 cases of transvaginal hysterectomy and 9 cases of anterior vaginal wall repair. Spinal anesthesia was performed by diluting 5 mg (1ml) of 0.5% high specific gravity bupivacaine with physiological saline to a total volume of 2 ml followed by centesis with a 27 gauge needle between L3 and L4 or between L4 and L5. The effect of the anesthesia was confirmed 10 minutes later. Sensory blocking was assessed using the Cold test, while motor blocking was assessed using the Bromage score (0 - able to raise lower extremities, 1 - able to move knees, 2 - able to move ankles, 3 - complete motor blocking). Urinary bladder internal pressure was compared between the absence of anesthesia at the time of admission and under spinal anesthesia during surgery.

Results

Sensory blocking was achieved to Th9 on average (Th8-Th10), and reliable analgesic effects were obtained to above the navel. There was no pain during surgery for 2 hours, and there were no cases that required the addition of other analgesics during surgery. Nine of the 25 cases complained of pain for an average of 6 hours after surgery, and NSAIDs were used to accommodate this. Motor blocking was mild, exhibiting an average Bromage score of 0.8 (0-2). There were no significant differences observed with respect to intravesical pressure induced by coughing, with that in the absence of anesthesia being 84.3 (± 11.2 SD) cmH₂O, and that under anesthesia during surgery being 82.7 (± 13.3 SD) cmH₂O. All of the patients were able to raise their lower extremities three hours later. Stress urinary incontinence was no longer observed in any of the patients after surgery, and none of the patients experienced problems with residual urine.

Conclusions

TVT surgery is expected to become a day surgery, thus requiring the use of as mild an anesthesia as possible. On the other hand, it is important to adequately eliminate pain in order to effectively respond to patients' expectations of a minimum invasive therapy. However, the use of local anesthesia makes it difficult to adequately eliminate the pain associated with injection of an introducer from the perineum to the abdominal wall as well as the discomfort resulting from the insertion of mandrin into the urinary bladder. In addition, epidural anesthesia requires that the anesthetic be allowed to adequately penetrate to the sacral region in order to obtain sufficient analgesic effects extending from the lower abdomen to the perineum, thereby making it necessary to insert two tubes above and below. In contrast, spinal anesthesia using low-dose bupivacaine is characterized by the obtaining of

reliable sensory blocking from the sacral region to the lower abdomen with only mild motor blocking using a simple procedure. Consequently, this enables coughing stress tests to be performed, and is considered to be an anesthetic procedure ideally suited for TVT surgery. Although there are many cases in which a stress test is not required to determine the location of the tape as the physician becomes more experienced with the TVT procedure, there are also numerous patients presenting with other concomitant factors that have an effect on urination, including concomitant pelvic organ prolapse repair and the removal of intravaginal appliances. Spinal anesthesia using low-dose bupivacaine is therefore considered to be a useful method for confirming the maintaining of urinary continence during stress even in such cases like those described above.