

Transient obturator neuropathy due to local anesthesia during transobturator sling placement

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Received: 18 May 2008 / Revised: 4 June 2008 / Accepted: 22 June 2008
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Abstract The transobturator tape procedure is a popular minimally invasive procedure to treat stress urinary incontinence. A 42-year-old woman with stress urinary incontinence underwent a transobturator sling under intravenous sedation and local injection with a mixture of 0.5% bupivacaine and 1% lidocaine with 1:200,000 epinephrine. After surgery, she had difficulty with adduction of the left leg, consistent with a left obturator neuropathy, which improved after approximately 12 h and completely resolved by the next day. Although the transobturator tape is an effective, minimally invasive procedure that may be performed on an outpatient basis, caution should be used in the dosage, type, and amount of local anesthesia used. Post-operative obturator paralysis can be expectantly managed as the symptoms should resolve after the local anesthesia wears off.

Keywords Complications · Transobturator tape · Mid-urethral sling · Nerve injury · Obturator neuropathy · Local anesthesia

Introduction

Mid-urethral sling procedures represent a minimally invasive approach to treat female stress urinary incontinence. The tension-free vaginal tape (TVT) was first described in 1996 by Ulmsten et al., which has high long-term success rates [1]. Nevertheless, complications associated with the TVT have included reports of bladder perforation, vascular injury [2], and bowel complications [3]. The transobturator tape (TOT) procedure was first introduced in 2001 by Delorme in order to avoid the morbidity associated with the retropubic route.

Regardless of the type of approach, one of the main advantages of the mid-urethral slings is that they may be performed with small incisions on the anterior vagina and the abdomen or inner thighs with less associated post-operative pain, and operating times of less than an hour on an outpatient basis. Local anesthesia with intravenous sedation may be used to decrease the morbidity and side effects associated with general or regional anesthesia. The following report illustrates a case of transient obturator neuropathy from local anesthesia administered during the placement of a transobturator sling.

Case

The patient was a 42-year-old gravida 2 para 2 female who complained of leaking urine with coughing, laughing, and lifting since the birth of her last child. She had tried Kegel exercises with only minimal improvement. Her past medical and surgical histories were significant only for hypothyroidism and a history of a hernia repair as a child. Physical examination revealed urethral hypermobility, with an otherwise unremarkable pelvic examination with a

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normal sized uterus, and minimal pelvic organ prolapse. Urodynamic testing revealed leakage with a standing cough stress test, a Valsalva leak point pressure of greater than 100 cmH₂O, and no evidence of detrusor overactivity.

She desired surgical management for her stress incontinence and underwent a transobturator sling under IV sedation and local anesthesia. She was injected with a total of 44 mL of equal parts of 0.5% bupivacaine and 1% lidocaine with 1:200,000 epinephrine. The usual practice was to place approximately 30–35 mL of the bupivacaine and lidocaine mixture: 10 mL on each side from the skin below the insertion point of the adductor longus tendon down to the internal edge of the ischiopubic ramus along the medial aspect of the obturator foramen bilaterally for a total of 20 mL, 5 mL on each side along the anterior wall of the vagina to the inferior pubic ramus for a total of 10 mL, and 5 mL on each side into the anterior vaginal mucosa for a total of 10 mL. Due to difficulty achieving proper IV sedation, the larger amount of 44 mL was given as the patient was moving and in pain. The transobturator mid-urethral sling (Monarc, American Medical Systems, Minnetonka, MN) was placed with a total operating time of 25 min. She was noted to have difficulty walking to the bathroom, stumbling on the way there, which was attributed to the after-effects of IV sedation. She then voided adequately in the recovery room. Subsequently, she was discharged home. She called in to the office 8 h after the end of her surgery stating that she could lift and abduct her left leg, but could not adduct her left leg. She denied any pain or sensory deficits. That evening, approximately 12 h after the surgery, the patient reported that she was able to move her leg better, and by the next day her impaired leg adduction had completely resolved.

Discussion

The use of mid-urethral slings has become increasingly popular since the introduction of the tension-free vaginal tape (TVT). The overall incidence of complications associated with the TOT is unknown, although a recent study using MAUDE, the Food and Drug Administration database that collects voluntary reports of complications associated with medical devices, showed these complications to include mesh erosions, bladder perforations, urethral injury, nerve injuries, large blood losses >600 mL, and abscesses in the ischio-rectal fossa or involving the adductor muscles. Specifically, there were four cases of neuropathy. Two patients were reported to have difficulty

ambulating, one of whom was diagnosed with an obturator nerve injury by a neurologist. The third reported case had left lateral calf, foot, and posterior thigh numbness, while the final patient had an unspecified neuropathy.

This case illustrates that local anesthesia injected along the obturator foramen may cause a transient obturator neuropathy as evidenced by the inability to adduct the leg, with the resolution of symptoms approximately 12 h after surgery. The duration of bupivacaine can range from 2–9 h, while lidocaine lasts 10–20 min. However, epinephrine causes a vasoconstriction that potentiates the depth and duration of the local anesthesia by decreasing the rate of vascular absorption and allowing more anesthetic molecules to reach the nerve membrane. The anatomic relationships of the obturator nerve relative to the transobturator sling have been previously described, with the mean distance of the TOT to lie approximately 2.6 cm (range 1.5–2.8 cm, SD ±0.8) away from the anterior branch of the obturator nerve, and 2.5 cm (range 1.2–3.5 cm, SD ±0.7) away from the posterior branch of the obturator nerve [4]. The proximity of the obturator neurovascular bundle puts it at risk of injury during this procedure. Bupivacaine was used in order to achieve longer post-operative pain relief, but in this case, the higher than average dose of bupivacaine, with its duration potentiated by the epinephrine, caused a transient neuropathy from local anesthesia during the placement of the transobturator tape.

Persistent obturator nerve injury has been reported as a result of this TOT procedure [5]. This case demonstrates that local anesthesia can cause an immediate paralytic effect on thigh adduction, which can cause difficulty with walking. It can be expectantly managed and ultimately will resolve after the locally injected anesthesia wears off. Caution should be used with the dosage, type, and amount of local anesthesia used. The use of bupivacaine as the local anesthetic in TOT and TVT procedures deserves further study as its long duration of action puts patients at higher risk for this complication.

Conflicts of interest Mark D. Walters is a consultant for American Medical Systems.

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