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Two case reports of obturator nerve block for transurethral resection of bladder tumour

兩宗阻塞閉孔肌神經以進行經尿道切除膀胱腫瘤的病例報告

This report describes two cases of severe adductor muscle spasm during transurethral resection of bladder tumours and subsequent successful management with the help of obturator nerve block. Obturator nerve blocks are useful during surgery to remove large, advanced tumours in the distal lateral wall of the bladder.

本文描述兩宗在經尿道切除膀胱腫瘤過程中發生嚴重內收肌痙攣，隨後透過阻塞閉孔肌神經成功治理的病例。阻塞閉孔肌神經在切除大型末期膀胱遠側壁腫瘤的外科手術過程中十分有用。

Case reports

Case 1

An 80-year-old woman was admitted to the North District Hospital in October 2001 because of a large carcinoma in the lateral wall of the bladder. She had diabetes mellitus, which was controlled by oral hypoglycaemic drugs. She was scheduled to undergo transurethral resection of the bladder tumour under spinal anaesthesia. During this procedure, spinal puncture was performed under aseptic conditions at the L3-4 level: 2 mL of 0.5% bupivacaine was injected via the spinal needle, resulting in complete motor block below L1; the sensory block was completely below T10 dermatome. During electrocauterisation of the tumour, however, the patient had severe adductor muscle contraction, which prevented surgery from proceeding further. After discussing the situation with the surgeon, the anaesthetist administered general anaesthesia (propofol 100 mg) and a neuromuscular blocking agent (rocuronium 30 mg) to allow surgery to continue. A 7-mm endotracheal tube was also inserted, and mechanical lung ventilation was used to maintain adequate gas exchange. However, adductor muscle contraction still occurred when the bladder tumour was cauterised. Despite incomplete excision of the bladder tumour, surgery was abandoned because of the potential risk of bladder perforation, and it was rescheduled for 1 week later.

At the second surgery, the patient was given general anaesthesia with fentanyl 50 μg and propofol 90 μg. A size 3 laryngeal mask airway was inserted and the patient was allowed to breathe an anaesthetic mixture of nitrous oxide and isoflurane in oxygen. Bilateral obturator nerve block was then performed: a 50-mm long stimuplex (B Braun, Melsungen, Germany) needle that was connected to a stimulating current at 2 mA was inserted 1.5 cm caudally and laterally to the pubic tubercle. The needle was then slowly introduced below the horizontal remus of the pubis and inserted deeper until its tip laid in the obturator canal. The optimal needle position was reached when the minimal stimulating current (<0.5 mA) induced adductor spasm. Once this position was reached, 7.5 mL of 2% xylocaine containing 1:200 000 adrenaline were injected. The whole procedure was repeated on the other side. Rocuronium 40 mg was then given intravenously to achieve complete muscle paralysis, at which point mechanical lung ventilation was started. Surgery proceeded smoothly, at the end of which neostigmine and atropine were given to reverse

Key words:
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Table 1. Characteristics of patients undergoing transurethral resection of bladder tumours at the North District Hospital, October 1998 to September 2002

Characteristic	No. (or age)
No. of patients	75
Males	51
Females	24
Mean age (range) [years]	72.1 (20.0-95.0)
ASA* status: 1	9
2	50
3	16
No. of transurethral resections†	136
General anaesthesia	20
Spinal anaesthesia	100
Combined spinal and general anaesthesia	16

* ASA American Society of Anesthesiologists
† Each patient may undergo more than one procedure

the effect of neuromuscular blockade. Recovery was uneventful. Tumour staging of the resected specimens showed advanced transitional cell carcinoma.

Case 2

An 84-year-old man was admitted to the North District Hospital in January 2002 because of a large tumour on the right lateral wall of the bladder. Apart from mild hypertension, which was controlled medically, he had been enjoying good health. Spinal anaesthesia for transurethral resection of the tumour was given: 2.4 mL of 0.5% bupivacaine in heavy glucose together with fentanyl 40 μg was given intrathecally at the L3-4 level. Complete motor block up to L1 and sensory block up to T9 were achieved. During the bladder tumour resection, however, severe adductor muscle spasm occurred. Thus, a right obturator nerve block was performed percutaneously (with the patient remaining in the same position as he had been in during lithotomy) using a nerve stimulator as a guide. After the right obturator nerve had been located, 20 mL of 2% xylocaine with adrenaline were injected. Surgery was completed without complication, and tumour staging of the resected specimen showed advanced transitional cell carcinoma.

Discussion

Sudden adductor muscle spasm can occur when the obturator nerve is directly stimulated by the electrical current transmitted by the resectoscope, especially when the surgeon is operating at the lateral wall of the bladder, where the obturator nerve runs in close proximity during its intrapelvic course. Because of the risk of inadvertent perforation when spasm occurs, standard urology textbooks[1] recommend general anaesthesia with the use of muscle relaxants for the transurethral resection of bladder tumours.

However, patients are elderly (Table 1) and usually have co-existing medical problems. Hence, spinal anaesthesia has its advantages in avoiding intra-operative and postoperative complications. At the North District Hospital, spinal anaesthesia has been the standard technique for transurethral resection of bladder tumours for the past 4 years. General anaesthesia is given only to uncooperative patients, patients with unsuccessful spinal block, or when operating conditions are not satisfactory (including when adductor muscle spasms occur).

The incidence of adductor muscle spasm during the transurethral resection of a bladder tumour is difficult to ascertain, because it depends on the anaesthetic and surgical techniques used; the location and extent of the tumour (Table 2); and the magnitude of the electric current. Prentiss et al[2] reported a 20% incidence of severe adductor muscle contraction in patients undergoing transurethral surgery for large intra-urethral prostatic adenomas or laterally located bladder tumours. Many surgeons anticipate and report some adductor spasm when resecting tumours in the distal lateral wall in close proximity to the course of the obturator nerve. The magnitude of the spasm can be diminished by reducing the electrical current. However, in some situations, administration of a muscle relaxant or other methods of efferent nerve blockade may be necessary.

Between October 1998 and September 2002, surgeons at this institution performed 136 transurethral resections of bladder tumours on 75 patients (Table 1); obturator nerve block was required in only three cases, two of which are described in this report. In the first case, the patient had a large lateral tumour of the bladder wall. She had adductor spasm during spinal anaesthesia, and although an adequate level of sensory and motor blockade was subsequently reached, direct stimulation of the obturator nerve elicited severe adductor spasm. (Adductor spasm persisted even after a normal dose of muscle relaxant.) In the second case, the patient also had a large lateral wall tumour, and adductor spasm also occurred despite adequate sensory and motor blockade. In the third case (not reported), obturator nerve block was performed prophylactically in a patient who had a large invasive tumour in the lateral wall of the bladder. The surgeon had anticipated difficulty in resecting the tumour and thus requested a prophylactic obturator block.

Table 2. Site and staging of bladder tumours*

	Bladder neck and trigone	Lateral wall	Anterior wall	Posterior wall	Dome	Total
Stage T_1 and Ta	19	33	14	5	5	**76**
Stage T_2	26	47	13	8	4	**98**
Stage T_3 and above	8	6	5	2	0	**21**
Total	**53**	**86**	**32**	**15**	**9**	**195**

* Each procedure may resect more than one tumour; data are for the 136 transurethral resections at the North District Hospital, October 1998 to September 2002

Compared with other series, the incidence of severe obturator spasm among the 75 patients who underwent transurethral resection at this institution is low (3%). It is possible that among these patients, most of whom received spinal anaesthesia for the procedure, the magnitude of adductor spasm was small even if the obturator nerve was stimulated during surgery. Gasparich et al[3] reported no incidence of adductor spasm in their series of 275 transurethral resections during a 2-year period in which obturator nerve block was routinely used. Furthermore, Nairins and Lief[4] advocate the routine administration of muscle relaxants for transurethral resection of bladder tumours to prevent adductor muscle spasms. The use of general anaesthesia and muscle relaxants for this surgery are not recommended by the author because most of these patients are elderly and may have concurrent medical problems, both of which increase the complication rate of general anaesthesia. Most patients can be operated on using spinal anaesthesia. Obturator spasms can be avoided by implementing appropriate surgical techniques (eg not using high-magnitude diathermy currents). Surgeons at this hospital would perform obturator nerve block if spasm still occurs, or when surgeons anticipate difficulty—usually in the resection of large, advanced tumours of the lateral wall.

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