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OBTURATOR NERVE BLOCK;
TRANSURETHRAL RESECTION OF LATERAL BLADDER WALL TUMOURS (TUR-BT)

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ABSTRACT... Objectives: To evaluate the efficacy of obturator nerve block combined with spinal anaesthesia for prevention of adductor muscle spasm and its associated complications during transurethral resection of bladder tumours located at its lateral and inferolateral wall. **Study design:** A prospective study. **Setting:** At AFIU Rawalpindi. **Period:** From January 2005 to December 2006. **Material and method** Fifty patients who had tumours at their lateral / inferolateral bladder wall of physical status ASA I – IV received spinal anaesthesia at 3rd or 4th lumbar space followed by obturator nerve block with a view to preventing adductor jerk during resection of tumour. **Results:** There was complete suppression of adductor jerk in 45 (90%) patients and surgery was completed smoothly. Two patients (4%) had mild adductor jerk and additional sedation was required. The block failed to work in 3 (6%) cases and required conversion to general anaesthesia. Thus the procedure was successful in 94% (complete and partial suppression of jerk. **Conclusion:** We conclude that spinal anaesthesia combined with obturator nerve block is an effective technique for preventing adductor jerk during TUR-BT, thus avoiding intra-operative and post operative complication.

Key words: Spinal anaesthesia, Bladder tumour, Obturator nerve block, Insertion adductor contraction interval (ICI).

INTRODUCTION

Obturator nerve (L_{2-4}) is the main motor supply to three adductors of the thigh (adductor longus, adductor magnus and adductor brevis). Although it does not supply the urinary bladder itself, it runs in close proximity to the lateral bladder wall during its intrapelvic course. This fact makes it highly relevant to the urologist while performing TUR-BT particularly the ones located at the lateral and inferolateral bladder wall.

Resection of tumour at lateral bladder wall causes direct electrical stimulation via diathermy current leading to sudden contraction of adductor muscles of thigh (called

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adductor jerk).

This makes the procedure not only difficult for urologist but also there is considerable risk of bladder perforation[1,2].

Standard textbooks recommend general anaesthesia with muscle relaxants for such procedure[3]. However most of the patients are elderly and have coexisting medical problems. Spinal anaesthesia with obturator nerve block has its advantages in avoiding intra and post operative complication[4].

OBJECTIVE OF THE STUDY

The purpose of this study was to evaluate the efficacy of obturator nerve block combined with spinal anaesthesia for resection of lateral and inferolateral bladder wall tumours. Lack of any study from Pakistan prompted us to carry out this study.

MATERIAL AND METHODS

This study was carried out at AFIU Rawalpindi from January 2005 to December 2006. After obtaining institutional approval and informed consent, 50 patients who had tumour at lateral and inferolateral bladder wall were selected. These consisted of 44 male and 06 female patients of ASA physical status I – IV. The mean age was 64 years (46-82 years). Spinal anaesthesia combined with obturator nerve block was administered. Forty seven patients received unilateral block while 03 patients were administered bilateral obturator nerve block (Table-I). After intravenous line was secured patients were pre-loaded with 800-1000 ml of 0.9% isotonic saline. Monitoring included non-invasive blood pressure (NIBP), pulse, SaO_2 and ECG. Spinal anaesthesia was then administered in lateral or sitting position with 0.75% hyper baric abocain spinal 12-15 mg at 3rd or 4th lumbar space with a 25 G Whitacre needle. The patients were immediately returned to supine horizontal position. After confirming level of spinal anaesthesia for TUR, obturator nerve block was performed using the traditional approach (3 cm lateral and 3cm inferior to pubic tubercle) with 22 gauge Teflon insulated stimuplex needle from M/S B. Braun Germany, using nerve stimulator as guide. After confirming the exact location of nerve 10-15 ml of 1% Xylocain with adrenaline was administered. All the patients received supplemental Oxygen while sedation was achieved with 1-2 mg dormicum (midazolam). TUR-BT was started by the urologist 10 minutes after the block. Efficacy of the block was evaluated by insertion adduction contraction interval (time between introduction of stimuplex needle and appearance of first adductor twitch) and completion of block i.e. complete suppression of adductor jerk, mild adductor jerk or complete failure to block adductor jerk.

RESULTS

Resection time for the tumour ranged from 20-40 minutes. Insertion adduction contraction interval (ICI) was 30 seconds ± 10 seconds. There was complete suppression of adductor jerk in 45 patients (90%), while 02 patients (4%) experienced mild adductor jerk and required additional sedation. There was complete failure of block in 03(6%) patients requiring general anaesthesia to complete the procedure. There was no local anaesthetic toxicity. No intraoperative or postoperative complications were encountered and the recovery was uneventful. Thus the procedure was successful in preventing adductor jerk during TUR-BT in 94% of the patients (complete and partial suppression of the jerk).

DISCUSSION

The incidence of adductor muscle spasm during TUR-BT depends upon anaesthetic and surgical technique used; the location and extent of tumour and magnitude of electric current. Prentiss et al[5] reported 20% incidence of severe adductor spasm in patients undergoing surgery for lateral bladder wall or intra urethral prostatic adenomas. The magnitude of spasm can be reduced by decreasing intensity of electric current and transpositioning of inactive electrode from buttock to thigh[6,7]. Other methods of reducing adductor spasm include performing TUR at low bladder volumes and resection of tumour in smaller chips[6,7]. Transurethral resection using 0.9% normal saline as irrigating fluid has also been recommended to reduce adductor spasm[8,9,10]. Akata et al[11] has reported a case of life threatening haemorrhage following obturator artery injury during transurethral bladder surgery, following sequel of an unsuccessful obturator nerve block.

At Armed Forces Institute of Urology (AFIU) Rawalpindi; general anaesthesia with muscle relaxant had been the standard technique for the last 11 years (1993-2004). Spinal anaesthesia was given only to very high risk patients and that too, without obturator nerve block. Adductor jerk was common in these patients specially while operating on lateral bladder wall. From January 2005 to December 2006 urologist at this Institute performed 50 transurethral resection of lateral / inferolateral bladder wall tumour (Table-I).

Table-I. Demographic Data (n=50)

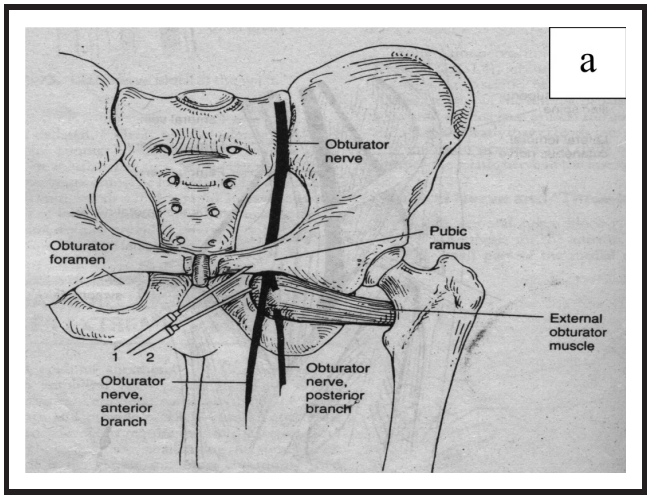
	No of Patients
Male	44
Female	6
ASA Physical status	
I	5
II	18
III	20
IV	07
Mean age year	64 (46-82)
Unilateral	47
Bilateral	3
Duration of surgery	20-40 minutes

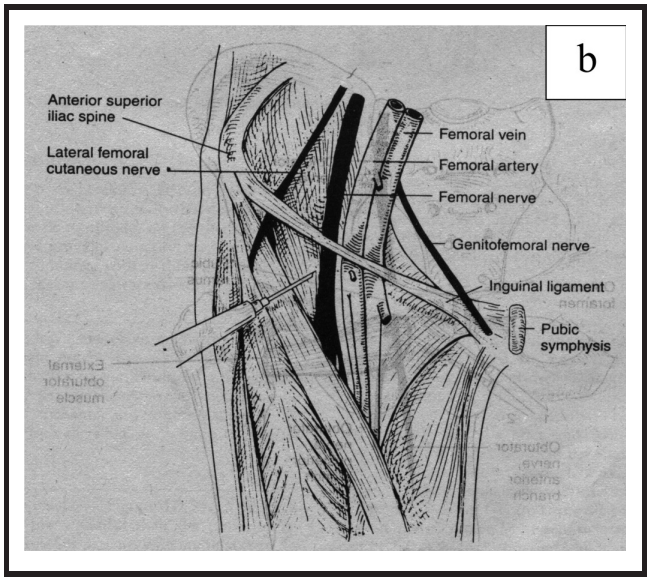
Table-II. Success Rate and Insertion adductor contraction interval (ICI)

Success rate	No of patients
Complete suppression of adductor jerk	45 (90%)
Mild adductor jerk	2(4%)
Complete failure to block	3 (6%)
I C I (s)	30±10 Sec
Local anaesthetic toxicity	-

All these patients received spinal anaesthesia with obturator nerve block.

There are three approaches to obturator nerve block (OBN). The first is the direct or traditional approach in which using public tubercle as landmark the needle is inserted at 3 cm lateral and 3 cm inferior to pubic tubercle (Fig-a). In second method of 3 in 1 block as described by Winnie in 1973 (Fig-b), the insertion point of needle is just lateral to femoral artery in femoral triangle.





This approach blocks femoral nerve and lateral cutaneous nerve of thigh in addition to obturator nerve but it spares the posterior division of obturator nerve. In the third method of interadductor approach as described by Wassef[12] in 1993, we approach the nerve at 1 cm

behind to adductor longus tendon and 2 cm lateral to pubic arch (Fig-c). In our study we used direct approach because this approach is significantly more effective than 3 in 1 block in producing motor block[13].

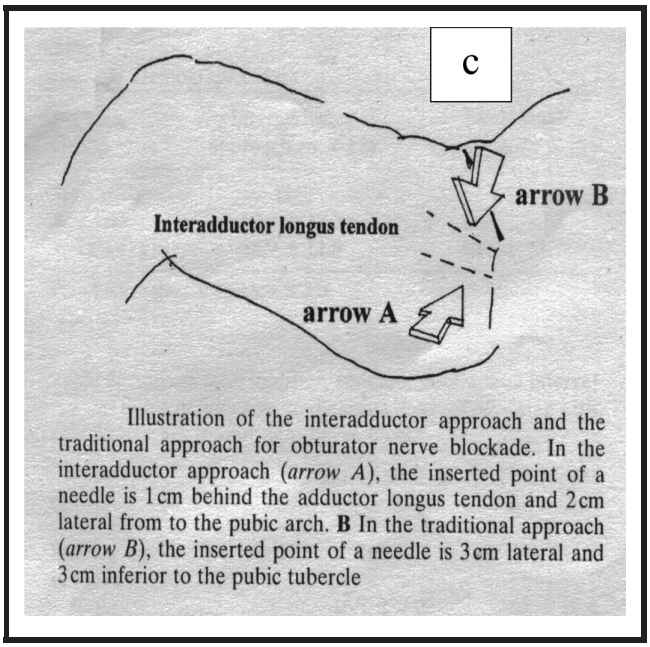


Illustration of the interadductor approach and the traditional approach for obturator nerve blockade. In the interadductor approach (*arrow A*), the inserted point of a needle is 1 cm behind the adductor longus tendon and 2 cm lateral from to the pubic arch. **B** In the traditional approach (*arrow B*), the inserted point of a needle is 3 cm lateral and 3 cm inferior to the pubic tubercle

The disadvantage of 3 in 1 block is that the posterior division of obturator nerve is spared. The first two approaches are performed in supine position whereas we use lithotomy position in interadductor approach.

The success rate described in literature for this block ranges between (80-100%)[5,14] whereas in our series it was 94% which is comparable with the international figures.

CONCLUSION

We conclude that obturator nerve block combined with spinal anaesthesia is an effective technique for preventing adductor jerk for the resection of lateral and inferolateral wall tumour. This is particularly so in elderly patients with concurrent medical disease where general anaesthesia may be associated with intra and post operative complication.

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