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Study To Evaluate The Efficacy of Obturator Nerve Block in Preventing The Adductor Spasm in Transurethral Resection of Bladder Tumors

KEYWORDS: Obturator nerve block; Adductor Spasm; TURBT

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ABSTRACT ***Background:*** *Bilateral obturator nerve block (ONB) combined with subarachnoid block has become a widely accepted, safe and viable technique to avoid adductor contraction during transurethral resection of prostate. It can be used in all those patients where administration of General anaesthesia carries lot of risk.*

Material & Methods: *Prospective study was conducted using ONB with blind anatomical approach along with spinal anaesthesia in 20 patients suffering from bladder tumor involving the inferolateral wall.*

Results: *Total number of patients was 20 with male predominance Mean age of patients was 63.65 years. Average size of tumor was 5.15 cm. Duration was significantly related to size of tumor and number of masses ONB was completely successful in 90% cases.*

Conclusion: *We conclude that obturator nerve block when administered along with spinal anaesthesia for TURBT is extremely safe and effective method of anaesthesia to overcome adductor contraction.*

Introduction

Transurethral resection of a bladder tumor (TURBt) is often performed with spinal anaesthesia, but it cannot block the obturator jerk reflex. Narins (1957) and Hobika (1961) proposed the use of d-tubocurarine and succinylcholine to block neuromuscular transmission during general anesthesia, in order to prevent the obturator jerk reflex. Administration of neuromuscular blockers requires endotracheal intubation, which bears lot of risk especially in geriatric patients. Prentiss (1965) proposed regional anesthesia to block the obturator nerve to prevent obturator jerk reflex during TURBt.[1]

Obturator nerve (ON) originates from L2 - L4 lumber plexus and passes through obturator foramen. It supply adductor muscles of thigh and passes close to inferolateral bladder wall, bladder neck and prostatic urethra.[2] Obturator jerk reflex mainly exaggerates when resection of bladder wall tumor is performed on lateral wall.[1] Incidence of bladder tumor is more in geriatric age group. These patients usually have number of problems like chronic obstructive pulmonary disorders (COPD), Hypertension, Ischemic heart disease etc. Administration of General Anaesthesia (GA) carries lot of complications in such patients. Administration of general anaesthesia in patients with COPD and cor pulmonale, can increase pulmonary artery pressure, can cause bronchospasm due to airway instrumentation, atelectasis due to decreased functional residual capacity and lithotomy position, ventilation perfusion mismatch and pneumothorax due to possibility of rupture of emphysematous bullae under general anesthesia. In cardiac patients cardiac events gets exaggerated after GA administration. Bilateral obturator nerve block (ONB) combined with subarachnoid block has become a widely accepted, safe and viable technique to avoid adductor contraction during transurethral resection of prostate [3]

We conducted prospective study to assess the effect of Obturator nerve block in abolishing Obturator reflex in patients undergoing transuretheral resection of lateral wall bladder tumor using blind anatomical land marks along with spinal anaesthesia (SA).

Methods

This prospective study was performed in 20 patients irrespective of age and sex. The patients suffering from bladder tumor involving the inferolateral wall were included in the study. All the patients received SA with ONB. Patients having abnormal coagulation profile, infection at injection site and allergy to local anaesthetic agents were excluded from the study. All the subjects were examined preoperatively, and details regarding clinical history and general physical examination were recorded. Routine investigations were carried out and informed written consent from all the participants was obtained. In the operating room, intravenous line was established and standard monitors [non-invasive blood pressure, electrocardiography, and pulse oximetry] were attached. Under all aseptic and universal precautions, SA was administered in lateral decubitus position at the L3–L4 interspace. Depending upon the location of tumor patients was given unilateral or bilateral ONB. ONB was administrated by blind anatomical approach. Patient was put in supine position, with thigh externally rotated and abducted. Block was administered using 22 gz spinal needle. Needle was inserted at point 2cm lateral and 2cm inferior to pubic tubercle. The needle was inserted through skin vertically after touching the inferior ramus of pubis, needle was slightly withdrawn, it was advanced laterally and superoposteriorly. After aspiration 6 ml of 0.25 % sensoricaine was given through the needle. Injection was repeated on the contralateral side if required. GA with muscle relaxation and intubation was planned in those cases where ONB failed.

Outcome was measured by presence or absence of jerk and any complication of the procedure. Data was tabulated and analyzed.

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Results

Out of total 20 patients 15 were males and 5 females. Mean age of patients was 63.65 years with a range of 45 to 87 years. On examination 6 patients were found to be hypertensive, one had old history of ischemic heart disease (IHD) and 3 were having chronic obstructive pulmonary disease (COPD). Size of tumor ranged from 3 to 8 cm with average size 5.15 cm. Mean duration of surgery was 32.1 minutes with range of 18-50 minutes. Duration was significantly related to size of tumor and number of masses. Bilateral ONB was administered in 16 patients rest 4 patients received unilateral block. Episodes of adductor spasm were recorded in all the patients. Block was successful in 18 patients and 2 patients showed repeated episodes of jerks during the surgery due to inadequate effect of block. GA was supplemented in these patients to avoid adductor spasm. Complication like intravascular injection of local anaesthetic, hematoma formation, bladder perforation etc was recorded and but only one patient developed hematoma post injection.

Table 1
Demographic profile of patients

Parameters	Average	Range
Age (years)	63.65	45-87
Size of tumor (cm)	5.15	3- 8
Duration of surgery (minutes)	32.1	18-50

Table 2
Obturator block administration in patients

Obturator nerve block	No. of patients	Percentage
Bilateral Obturator nerve block	16	80
Unilateral Obturator nerve block	4	20
Adductor spasm	2	10

Discussion

Spinal anaesthesia administered for TURBT does not prevent unintended stimulation of the obturator nerve when electroresection is performed on the inferolateral wall of the bladder.[4] It can result in adductors spasm and a sudden leg movement which in turn may lead to extraperitoneal perforation of bladder wall.[5, 6, 7] Spasm due to obturator nerve stimulation is a major problem when the resection involves area which is in close relation to the course of the nerve.[8]

Various methods have been described in literature to prevent Obturator reflex, which included reduction of the diathermy power, bipolar resection, GA or ONB following SA.[4] The occurrence of adductor contractions with Bipolar-TURBT is lower compared to TURBT when performed using unipolar cautery.[9]

Many clinicians prefer GA with muscle relaxation. It is not necessary to give ONB always with a subarachnoid block because it is required only in situation having large tumor and that too of lateral wall where stimulation of Obturator nerve is unavoidable. That is the reason why SA alone can't abolish the reflex.[8, 10] In our study also all the tumors selected for block was inferolateral in location.

Majority of these patients belong to geriatric age group and at times can have significant cardiac, respiratory and metabolic comorbidities; GA with muscle relaxation may not be suitable option in these patients.[3,8,10] Mean age of patient in our study was 63.65 years with various comorbidities like hypertension, IHD and COPD. Selective ONB along with spinal anesthesia is the most viable option as it can avoid major complications related to comorbidities in these patients.

It is not necessary that stimulation of every tumor located on inferolateral wall of the bladder will result in adductor spasm. In such cases prior cystoscopy should be done, by the urologist and neurotest should be performed with the use of a nerve stimulator inbuilt in the resectoscope, which helps in making the decision of administration of ONB.[4]

Either blind anatomical technique, or ultrasound guided technique can be used for block administration. Definitely ultrasound guided technique is considered superior but blind technique is simple, equally effective and can be used in the set ups where there is non-availability of advanced gadgets.[11, 12, 13, 14] Obturator nerve block was given by blind anatomical technique in all the 20 patients in our study with success rate of 90% and only in 2 patients failure of block was observed. Patel et al observed that adductor spasm was observed in almost all the patients who only received SA resulting in great disturbance to surgeon and fear of bladder perforation. Patients in which ONB was administered along with spinal anaesthesia, adductor spasm was noted only in one patient out of 25 patients.[4]

The ONB is associated with few complications as reported in the literature. These include visceral puncture and intra vascular injection of the drug both of which may occur due to improper placement of the needle.[4] Out of twenty patient single patient developed hematoma after the administration of block, which resolved spontaneously after 24 hours.

Conclusion

We conclude that obturator nerve block when administered along with spinal anaesthesia for TURBT is extremely safe and effective method of anaesthesia to overcome adductor contraction and thus preventing complication like bladder wall perforation. It also overcomes all the general anaesthesia related morbidities and extremely safe in geriatric patients.

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