AN EFFECTIVE TECHNIQUE OF OBTURATOR NERVE BLOCK TO PREVENT ADDUCTOR REFLEX DURING TRANSURETHRAL RESECTION OF BLADDER TUMOR

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ABSTRACT

Objective: To observe the efficacy of blind obturator nerve block by Labat technique for prevention of obturator jerk during transurethral resection of bladder tumor performed under spinal anesthesia.

Study Design: Descriptive Study.

Material and Methods: This was a single center based study conducted at tertiary care military hospital for a period of thirty months. Fifty five patients were recruited in the study, after identifying the location of bladder growth in the lateral wall on ultrasound USG and confirming its exact site on cystoscopic examination. Those eliciting obturator jerk during transurethral resection of bladder tumor (TURBT) were included and ONB was performed using 2% lidocaine via blind technique of Labat. TURBT was restarted and presence of obturator jerk was recorded if evoked (primary outcome).

Results: Median age was 67.3 ± 8 years with majority (72.7%) in the age group between 61 to 80 years. Male female ratio was 7:1. Fifty (90%) patients presented with solitary growth. Mean operating time was 28.8 ± 12 minutes. ONB was successful in 52 (94.54%) of the cases while failure in 3 (5.45%) resulted in conversion to general anesthesia for the completion of TURBT.

Conclusion: Blind obturator nerve block (ONB) by using Labat technique for obturator nerve block has proven to be simple, reliable and easily replicable in any set up and it does not require any time consuming steps or sophisticated equipment.

Keywords: Adductor reflex, Labat approach, Obturator nerve block, TURBT, Transurethral resection of bladder tumors, Urinary bladder growths.

INTRODUCTION

Bladder growth is the most prevalent urological malignancy reported in our setup. Transurethral resection of bladder tumor (TURBT) remains the main diagnostic and therapeutic modality in the early management of all bladder growths[1]. Obturator jerk (adductor reflex) due to contraction of adductor muscles, poses a major hurdle in safe and successful completion of TURBT under spinal anesthesia. To overcome this problem, various techniques have been evaluated with regard to their efficacy, safety, feasibility and ease of availability[1].

Obturator nerve has got a topographical relationship with the urinary bladder[2] resulting in its frequent stimulation and exhibiting dangerous obturator jerk during TURBT procedure. Available local literature is deficient as regards experience of its management[1]. Obturator nerve block (ONB) can be done blindly using anatomical landmarks[3]. Use of nerve stimulator and ultrasound guided nerve blocks have been described in other countries more successfully[4-7]. However, the availability of equipment, its cost effectiveness and technical expertise are a few handicaps which are to be considered in various health care setups. By utilizing and standardizing the technique of ONB, while making it safe and simple, the morbidity of TURBT and potential mortality can be significantly reduced[8]. To date no such prospective study has been carried out in Pakistan, neither in any military hospital or in the civil health setup of Khyber Pakhtunkhwa.

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Therefore, its role as primary modality in bladder growth resections can be conveniently adopted in our health care setups at no extra cost and advanced equipment, with acceptable efficacy.

PATIENTS AND METHODS

This was a single center based, quasi experimental study conducted at Combined Military Hospital, Peshawar, Pakistan, for a period of thirty months from Oct 1, 2011 to March 31, 2014. Fifty five (55) patients scheduled to undergo TURBT under spinal anesthesia (SA) were enrolled after seeking approval from the hospital ethical committee' and by obtaining informed written consent from the participants. The sample size was taken as such for convenience only. Sampling technique was consecutive (non probability) in nature. Control of bias and confounding factors was done by strictly following inclusion and exclusion criteria. Ethical issues and financial problems were properly addressed. Patients of all ages and both genders with growths on lateral wall of urinary bladder who could invoke obturator jerk during TURBT were included. Pre-existing obturator nerve injury, abnormal coagulation profile, infection at injection site and known allergy to local anesthetic agents were excluded from the study.

Firstly, cystoscopy was performed in lithotomy position under spinal anesthesia to see the locations of the growths. TURBT was started cautiously and on eliciting the obturator jerk, the procedure was temporarily halted and ONB on that side was performed. After waiting for five minutes, TURBT was continued till completion. All obturator nerve blocks were carried out by a single investigator not involved in further peri-operative care of those patients. Per operative findings during transurethral resection were evaluated. Primary outcome was measured by occurrence of jerk and secondary outcome included any complication of the procedure.

While the patient lying supine in lithotomy position with thighs externally rotated and abducted, the spine of the pubic bone on the involved side was identified. A point 1.5 cm lateral and inferior to it was marked for needle insertion. A 25G Quincke spinal needle was inserted perpendicular to the skin over this landmark until the upper part of the inferior ramus was contacted at an approximate depth of ½ to 1 inch. It was redirected laterally and slightly inferiorly to slip past the inferior ramus and just underneath the superior ramus of the pubic bone, then advanced an additional 1½ inch to lie in the area of the obturator foramen. Ten ml of 2% lignocaine inj. was infiltrated as the needle was moved back and forth slowly.

Table: Demographic and case characteristics of the patients.

Demographic parameters	Data
Total number of patients (n)	55
Male: Female ratio	07 : 01
Mean age (in years)	67.3 ± 8.07
Mean operation time (in minutes)	28.8 ± 11.91
Solitary bladder growth	50 (90.9%)
Multiple bladder growth	5 (9.09%)

Statistical Analysis

All the data were recorded and analyzed in microsoft excel 2013. The Mean ± SD was calculated for numerical values like age and operation time. Frequencies and percentages were calculated for variables like effectiveness of ONB, gender, size and site of growth.

RESULTS

This study comprised of 55 patients with 48 males and 7 females having 7:1 ratio. Mean age of the patients was 67.3 ± 8 years (range 44-86 years). Majority of patients (72.7%) were in the range of 61-80 years (table). Fifty patients (90%) had single growth (left sided 31, right sided 19)

while 10% had multiple growths. Average operative time was 28.8 ± 12 minutes. Three patients in whom GA was required for completion of TURBT consumed maximum operation time (>50 minutes). One patient (0.8%) required single blood transfusion owing to the massive size of growth. Obturator nerve block was completely effective in 52 (94.54%) patients, while three patients (5.45%) were given GA due to its failure. None of the patients developed any complication intra- or post-operatively.

DISCUSSION

Urinary bladder growth is the most prevalent of all urological malignancies in our area of referral. Performing TURBT under SA (spinal anesthesia) as compared to GA (general anesthesia) has many advantages like reduced duration of the procedure, reduced recovery time; rapid patient turn-over in one operating room; better postoperative analgesia and better tolerability in elderly patients due to cardio-pulmonary comorbidities[8]. However, adductor jerking laterally located growths poses a potential risk of resultant catastrophes such as bladder perforation and its sequel; hemorrhage and prolonged hospital stay[9-12]. To avoid such adversities, ONB is the standard procedure recommended. Various techniques of ONB have been studied universally as regards their reliability, ease of performance, availability of equipment and expertise[1].

About ten percent of the population has abnormal course of the obturator nerve[1,13]. In a few cases there exists an abnormal anastomosis between the external iliac and the obturator vessels called the corona mortis[4,10,14].

Prevention of obturator jerk had been a challenge and a dilemma in TURBT. Un-intentional stimulation of the obturator nerve results in a quick reflex contraction of the adductor muscles of thigh[1,4,15]. Incidence of severe adductor spasm has been documented to be around twenty percent[2,10]. Since 1961, different authors have utilized different procedures in pursuit of blocking the obturator jerk[10]. These encompass general anesthesia[10,16], reducing the current intensity of the resections[10,17], use of laser[10,18], reversing the polarity of the electric current[2,10], change in the site of inactive electrode[10,19], use of bipolar current[20], peri-prostatic infiltrations[10,21] and spinal anesthesia with selective obturator nerve block[10,21-22].

Prentiss RJ was the first to describe blind obturator nerve block in 1965[2]. It is an invasive, operator dependent technique historically riddled with complications ranging from mild to catastrophic[1], in less experienced hands. However, obturator nerve block is a safe and easy alternative to other modalities for prophylaxis against adductor jerk. It can be administered blindly, using either the classical approach of Labat or the inguinal approach of Cloquet[10,23]. The later was not chosen in our study owing to operator's inexperience in this technique. As per Rahman S and colleagues, re-injection was required due to failure of first block[1]. To prevent the possibility of local anesthetic toxicity, we converted our three cases (5.45%) of failed block into GA and subsequently proceeded with balanced anesthesia technique.

Use of ultrasonography and nerve stimulation technique has been recommended for application of obturator nerve block's[4-7], much ado without any extra advantage. Although these methods appear to be fascinating yet they are time consuming, expensive and are not readily available in many healthcare setups. Ultrasonographic imaging may be difficult because of small size, flatness and depth of posterior branch[10,24-25].

In our study, effectiveness of blind obturator nerve block was 94.54% as compared to 90.56% in study done by Malik et al[4]. We describe our exceptional results to better expertise as well as single operator involvement. Augsurqer et al have observed blind obturator block to be 83.8–85.7% effective in cases of TURBT[1]. Studies involving ultrasound (Helayel et al & Akkaya et al) and nerve stimulator (Gasperich et al and Kobayashi et al) to identify the obturator nerve

have found to be effective in 93-97% and 89.4–100% of their study populations respectively[4].

In spite of its excellent results, obturator block in TURBT is not without hazards. Complications are related to the anatomical site and the depth of insertion of the spinal needle[10]. The intra and post-operative complications and the ultimate efficacy of blind obturator nerve blocks are largely influenced by the involved technicalities and the experience of the operators[10]. Major complications enlisted in the literature include bladder perforation, vascular bleeding (life threatening if corona mortis is punctured), incomplete resection of growth leading to a redo surgery; and hazards of seedling and dissemination to other areas[4-5,15]. Anxiety, mild tremor and agitation have been rarely reported[1]. In contrast, we encountered three cases (5.45%) of failed block and in only one case (0.8%) transfusion of whole blood had to be given on account of the large size of the growth.

CONCLUSION

Blind obturator nerve block is safe, effective and operator friendly in the achievement of inhibition of the obturator jerk during TURBT.

Due to its simplicity in learning of technique and lower complication rate, we recommend the blind ONB using the classical approach of Labat, as the procedure of choice in our health careset ups.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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