

# Evaluation of Post Operative Urinary Bladder Distention at Prince Rashid Military Hospital

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## ABSTRACT

**Objective:** To assess and evaluate the occurrence of the post operative urinary distention using ultrasound technique.

**Methods:** A total of 328 patients who underwent abdominal, neurosurgical, orthopedic and ENT surgical procedures at Prince Rashid Bin Al-Hassan Hospital between 1<sup>st</sup> April 2009 till 28<sup>th</sup> February 2010, were included in the study. Post operative urinary distention was assessed using ultrasound at the time of discharge from recovery room. The variables in the study were age, gender, type of anesthesia, type and duration of surgeries. Simple descriptive statistic (frequency and percentage) was used to describe the study variables.

**Results:** Of the 328 patients who were included in the study, 134 patients (40.9%) were noted to have bladder distention. Eighty-three patients (25.3%) who had bladder distention were unable to urinate within 30 minutes and underwent transient urinary catheterization. These patients were older than 55 years, experienced long surgical procedures for more than 125 minutes; the majority of them were males and received spinal anesthesia.

**Conclusion:** For post operative urinary retention, it was concluded that spinal anesthesia, long duration of surgery and age of 55 years and above are at high risk of having urine retention. Ultrasound is considered a good and reliable technique to reveal bladder distention and urinary retention in these patients.

**Key words:** Evaluation, Post Operative, Urinary Bladder Distention

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## Introduction

Any surgery may contain certain complications; some of these results in post operative bladder distention and associated urinary retention. Those may cause pain and restlessness which can postpone patients discharge from hospital. One more complication is affection on the contractility of the detrusor muscle of the urinary

bladder which may lead to permanent damage of urinary bladder wall.<sup>(1-4)</sup>

The medical literature shows that the frequency of urinary retention may have a wide range of variation between 3% to 40% which is related to several factors, such as the population difference of the patients, operative conditions and difficulties in bladder volume estimation.<sup>(5-7)</sup>

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**Table I:** Comparison between patients with urine retention and other patients

	<b>Patients with urine retention (No. 83)</b>	<b>Other patients (No. 245)</b>
Mean Age of patients(year):	58	45
Range:	55 to 68 year	18 to 57 year
Duration of surgery (minutes)	125 (34 to 212 )	55 (35 to 70 )
General anesthesia	32(38.6%)	180 (73.5%)
Spinal anesthesia	51(61.4%)	65 (26.5%)
Male/female	52/31 (62.7%, 37.3%)	151/94 (61.6%, 38.4%)
Abdominal surgery	0 (72.3%)	161(65.7%)
Neurosurgery procedures	3 (3.6%)	15 (6.2%)
Orthopedic procedures	16 (19.3%)	40 (16.3%)
ENT procedures	4 (4.8%)	29 (11.8%)

Ultrasound technique is considered to be a rapid, noninvasive and accurate technique in the evaluation of bladder distention, especially after recent refinement of portable ultrasound in the measurement of bladder volume at bed side.<sup>(8-10)</sup>

The aim of this study was to assess and evaluate the occurrence of the post operative urinary distention using ultrasound technique.

## Methods

This is a descriptive study which was conducted at Prince Rashid Bin Al-Hassan Hospital between the first of April 2009 and the 28<sup>th</sup> of February 2010. A total of 328 adult patients who were scheduled for abdominal, neurosurgical, orthopedic and ENT procedures were included in the study.

Any patient who underwent emergency surgery or used bladder catheterization was excluded from our study.

The bladder volume was measured by the radiologist using ultrasound device (Philips. Envisor HD. USA) at times when patients met the criteria of discharge from the recovery room which included normal consciousness, stable vital signs, absence of vomiting, absence of sensory and motor block in cases where regional anesthesia was used and hence pain controlled.

Regarding the effect of spinal local anesthetic used in this study, all spinally anesthetized patients received the same anesthetic drug which was bupivacaine 0.5%, 3ml, which acts up to 6 hours duration, so as to avoid bias in our results.

Any one of our patients who was found to have bladder volume of more than 500ml as well as distended urinary bladder was asked to void, if he

fails within 30 minutes, then transient bladder catheterization is done to the patient.

In our study, we described bladder distention regarding the following variables, age, gender, type and duration of surgery and the technique of anesthesia.

## Results

A total of 328 patients who were included in the study, underwent abdominal (221cases, 67.4%), neurosurgical (18 cases, 5.5%), orthopedic (56 cases, 17.1%) and ENT (33 cases, 10.0%) procedures between the 1<sup>st</sup> of April 2009 and the 28<sup>th</sup> of February 2010; 203 of them were males and 125 were females, their ages ranged from 18 to 68 years with a mean of 46 years, 212 patients (64,6%) underwent surgery under general anesthesia and the remaining 116 patients (35.4%) under regional anesthesia.

Evaluation of bladder volume by ultrasound was performed in average at 125 minutes post operative with a range from 40 to 210 minutes after arrival to the recovery room. Bladder distention (more than 500ml) was noted in 134 patients (40.85%), 56 patients of them (42%) had distention of more than 700ml.

Fifty-one patients (38%) with bladder distention had the feeling of full bladder; only 3 patients of them could not urinate.

At the time of discharge from recovery room, 25% of our patients got urine retention, those patients were older than 55 years, had long surgical procedures of more than 125 minutes and the majority of them received spinal anesthesia as shown in Table I.

On the other hand, we found that urinary

retention was relatively more in males than females, which may be related to increase frequency of obstructive urinary symptoms that are related to benign prostate hyperplasia among males.

## Discussion

Ultrasound technique is a rapid, noninvasive and accurate technique in the evaluation and diagnosis of bladder distention.<sup>(8-10)</sup>

In the study of Rosseland and his colleagues<sup>(9)</sup> there was a bias of 21 ml between measurement of the ultrasound and the measurement of the urinary bladder volume using bladder catheterization in 39 patients, while it was 15ml in the study of Pavlin and his colleagues.<sup>(3)</sup>

Normal bladder capacity ranges between 400 to 600ml, a healthy person experiences the first desire to void at bladder volume of 150 ml and urge to void at 300ml, the situation is abnormal when there is no feeling of full bladder at 300 ml volume.<sup>(1)</sup>

In our study, we considered 500ml is the bladder volume threshold, while in Mulroy *et al*<sup>(11)</sup> they considered the patient who has urine retention when he is unable to void at volume of 400ml, while Pavlin and his colleagues<sup>(8)</sup> considered a bladder volume of 600ml as a threshold volume.

Pavlin *et al*<sup>(10)</sup> found that the frequency of urinary retention was greater after spinal / epidural anesthesia (13%) or hernia /anal surgery (17%) in patients managed by conventional means, also there was no change in bladder function post operatively in 5 patients with bladder volumes that temporarily exceed 900ml.

They observed also that no significant differences in post operative urinary tract symptoms between patients in whom the maximal bladder volumes temporarily exceed 500ml versus those with smaller maximal volume and their data suggest that transient over distention in the range of 500-1000 ml is not harmful if detected and treated early within two hours.<sup>(8)</sup>

In Tammela *et al*<sup>(12)</sup> study, there was an increase in frequency of persistent urinary retention in patients after unspecified inpatients surgical procedures when bladder drainage initially

yielded a volume >500ml versus  $\leq$  500ml, 51% of patients in this study were catheterized for the first time  $\geq$  12 hours after surgery, more rapid treatment of retention of urine in their patients might have prevented subsequent bladder dysfunction.

Baldini *et al*<sup>(13)</sup> study has shown that postoperative urine retention increases with age, the risk increased by 2.4 times in patients over 50 years of age, and its frequency is higher in men in comparison with women (4.7% versus 2.9%), also the prolong duration of surgery can cause post operative urine retention and the time to void was shown to be directly proportional to the total duration of anesthesia.

In fact, Pavlin *et al* found a significant correlation bladder volume and duration of surgery but failed to show a relationship between bladder volume and the total amount of fluid administered. In contrast Peterson *et al*<sup>(14)</sup> did not find any cause relationship between the duration of surgery and the risk of postoperative urine retention, which was frequently more noticed with spinal anesthesia because it causes clinically a significant disturbance of bladder function due to interruption of micturition reflex.

Kamphuis and colleagues<sup>(15)</sup> reported that the duration of action of local anesthesia has a great effect on the recovery of detrusor muscle function in that ,short acting anesthesia like lidocaine has a low effect on the urine retention.

Our study has demonstrated that the age above 50 years old, spinal anesthesia and long duration of surgery have a great effect on the occurrence of urine retention.

## Limitation of the study

Further prospective studies are needed to analyze the study variables affecting postoperative distension of Urinary Bladder.

## Conclusion

For post operative urinary retention, it was concluded that spinal anesthesia, long duration of surgery and age of 55 years and above are at high risk of having urine retention. In addition, we found that urinary retention was more in males than females (74.7% vs 25.3%), which may be related to increase frequency of obstructive urinary symptoms that related to benign prostate

hyperplasia among males ,hence it is worth inserting Foleys catheter before surgery.

Finally, ultrasound is considered a good and reliable technique to reveal bladder distention and urinary retention in these patients.

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