

Analysis of Suprapubic ultrasonographic measurements in Assessment of Prostate dimensions and Volume

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(Received 11/2 /2013 , Accepted 17/ 7/ 2013)

الخلاصة:

دراسة مقارنة اجريت في مستشفى الامام الحسين التعليمي في محافظة ذي قار للفترة بين تموز 2011 الى مايس 2012 فيها 43 مريض يعانون من تضخم البروستات مع وجود اعراض سريرية كضعف في قوة تدفق الادرار او انحباس الادرار وغيرها من العلامات الاخرى وقد كان فحص البروستات السريري والمختبري يشير الى عدم وجود اورام خبيثة.

كل هؤلاء المرضى الجري لهم فحص السونار عن طريق البطن من اجل قياس حجم البروستات حيث قورن بحجم البروستات الحقيقي من خلال وزنها بعد استئصالها بعملية جراحية .

قسم المرضى الى مجموعتين حسب حجم البروستات في السونار سواء كان اقل من خمسين مل وعددهم 17 مريضا واكبر من خمسين مل وعددهم 26 مريضا اثناء المقارنه تبين انه لا يوجد اختلاف ذو اهمية في قياس حجم البروستات الذي تم قياسه عن طريق السونار اذا ما قورن بالحجم الحقيقي للبروستات اثناء وزنها بعد استئصالها جراحيا

من كل هذا نستطيع التأكيد على ان فحص السونار يمكن أن يكون طريقة معتمده في تحديد حجم البروستات قبل العملية ولكون حجم البروستات يكون ذو أهمية كبيرة في تحديد طريقة العلاج ونوع الجراحة المستخدمة سواء كانت بواسطة المنظار او عن طريق الجراحة الاعتيادية، اصف الى كون الفحص بطريقة سونار البطن هي عملية غير مؤذية للمريض وليس فيها مخاطر كالاشعاع او غيرها اضافة الى كونها متوفرة ورخيصه نسبيا خاصة اذا قورنت بفحص السونار عن طريق المستقيم حيث ان الاخير غير محبذ للمرضى خاصة هؤلاء الذين يعانون من امراض الفتحة الشرجية كالبواسير وغيرها

Abstract

Objective: As far the prostate size is an important parameter to determine the way to treat the patient with BPH and the type of surgery used, so the objective of our study was to compare and evaluate the ultrasonographic size of the prostate by suprapubic rout with the real postoperative prostate size .

Materials and Methods: between July 2011 and May 2012 forty three patients underwent both preoperative suprapubic ultrasonography (SPUS) and either transvesical or retropubic prostatectomy for BPH was included in this study. Using ellipse volume calculation (height, length and width), SPUS prostate volume was determined, and was compared with the measured volume of the specimen post-operative.

Results: Prostate volume measured by SPUS, correlated closely with real specimen volume. The study revealed no significant difference between SPUS prostate volume and real post-operative specimen volume.

Conclusion: Prostate volume measured by SPUS closely correlates with real prostate volume. Furthermore, we suggest that when measuring prostate volume in this way, it's more comfortable to the patients and noninvasive procedure.

Introduction

With advancing age the prostate gland enlarges. Among men 40 years of age, 5 to 10% have prostate enlargement whereas at age 80, the percentage is as high as 80%.⁽¹⁾

Even though prostate enlargement in the elderly male is the rule rather than the exception, not all of those, who have

enlargement, will experience significant symptoms or elect treatment. Conversely, men without prostatic enlargement may experience marked symptoms suggesting bladder neck obstruction.⁽²⁾

In other words, size of the prostate correlates poorly with severity of symptoms and patients with palpable

huge prostate may have no voiding difficulties whereas some with small prostate have severe symptoms. In addition to this, prostatic obstruction may have a static as well as a dynamic component as a result of smooth muscle tone in the bladder neck area, prostate and prostatic capsule which can be abolished by alpha adrenoceptor blockers.^(3, 4)

These patients may have superadded medical problems such as diabetes mellitus, hypertension and coronary artery disease, also with the advent of transurethral resection of prostate and alternative' nonsurgical therapies such as transurethral laser-induced prostatectomy-TULIP^(4, 5) an accurate preoperative assessment of the size of the prostate is important so as to assess the need and the type of surgery as well as to obviate any difficulties at the time of surgery.⁽⁵⁾

Digital rectal examination can provide erroneous results in predicting the size of the prostate. Trans-abdominal sonography and more recently transrectal sonography provide accurate results. The prostate volume is an important parameter in the diagnosis and management of both benign and malignant prostatic disease. Suprapubic ultrasonography is commonly used to measure the volume of the prostate,

Surprisingly little information exists about the comparability of the suprapubic prostate size with the real prostate size postoperative size.

Dimension
s of the
prostate

are used as a preoperative criterion for deciding on the operation method like transabdominal open prostatectomy, transurethral resection (TUR), and laser ablation. Therefore, it is quite important to accurately assess the dimensions of the prostate in patients with benign prostate hyperplasia.⁽⁶⁾

Digital rectal examination and intravenous pyelography are inadequate for determining the prostate dimensions. Suprapubic ultrasonography is considered superior to digital rectal examination and cystourethrography in the evaluation of prostate volume.⁽⁷⁾ According to the literature, there is a strong correlation between prostate weights measured by Suprapubic ultrasonography and the real prostate weight in specimens excised operatively or in cadavers.⁽⁸⁾ Although it is accepted that TRUS is superior to suprapubic ultrasonography (SPUS) in the evaluation of the prostate, SPUS is used more commonly in the measurement of prostate dimensions.⁽⁹⁾

Aim of the study:

The objective of this study was to evaluate the accuracy of suprapubic ultrasonography done prior to surgery in measurement of prostate size compared with its postoperative specimen size. The study was designed as a prospective study done in Al-hussain teaching hospital in Thiqr.



Figure (1): Thiqr city.

Patient and methods:

Between July 2011 and May 2012, 43 patients with lower urinary tract symptoms were evaluated all of them had serum prostatic antigen (PSA) levels equal or less than 4 ng/dL and their digital rectal examination showed no abnormal sign. Those patients underwent suprapubic ultrasonographic measurements performed with a full bladder, which was determined as the patient having a desire to void, but not with a severe discomfort. Measurements were performed in the supine position. Measurements of the 3 dimensions of the prostate (anteroposterior, transverse, and craniocaudal) and its volume were calculated using the ellipsoid formula. Data were further analyzed in subgroups according to prostate volumes smaller or

larger than 50 ml, measured by suprapubic ultrasonography.

All patients were operated upon via the transvesical or retropubic route.

In the vast majority of these patients, the difference between the estimated size and that of the specimen was insignificant. Ultrasound examination is easy, fast, noninvasive and reasonably accurate.

Results and conclusion:**Results:**

The mean age of the patients was 66.5 years (range, 45 to 77 years) and the mean level of serum PSA was 2.8 ng/mL (range, 0.6 ng/mL to 4 ng/mL).

Of the 43 patients conducted patients the results of measurements performed by SPUS were compared with prostate size measured by prostate weight after surgical removal. (Table 1)

Table (1): ultrasonic prostate size and postoperative volume.

	SPUS	Surgical specimen	P value
Prostate volume(ml)	65.9	62.5	<.001

According to the results, volume measurements performed by SPUS were 3.4 greater than those measured by post-operative specimen (p value <.001).

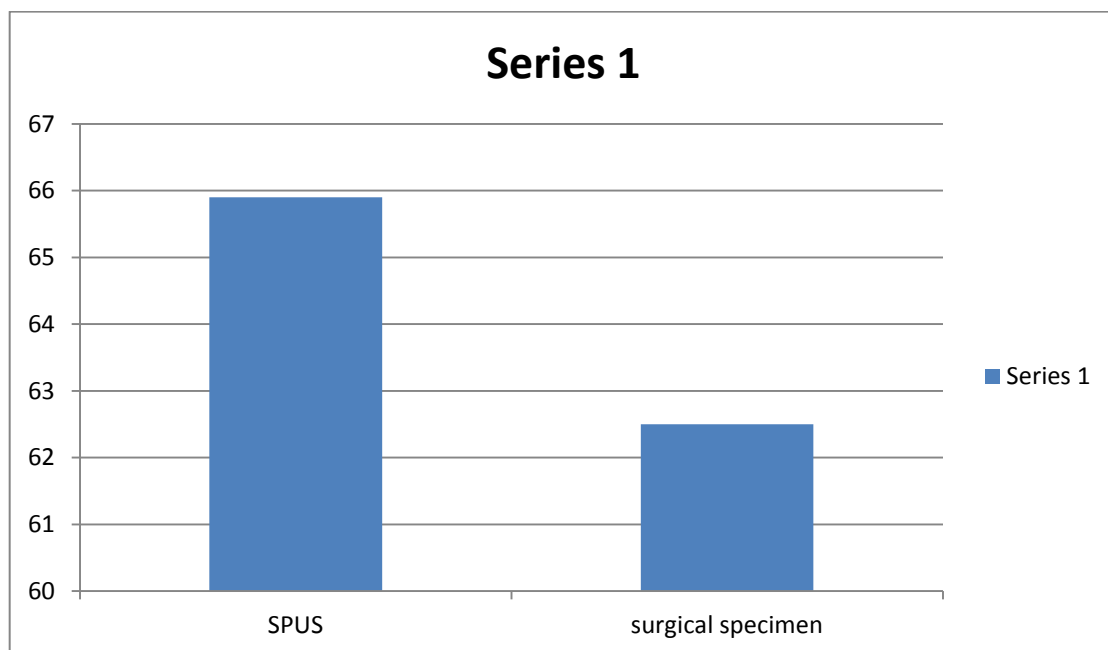


Figure (2): Comparison between SPUS and surgical specimen volume.

Table (2): the mean prostate volumes in groups of patients with a prostate volume of 50 ml or less and larger than 50 ml, based on the SPUS results.

Prostate volume	No. of patients	SPUS	Post op. Specimen vol.
<50 ml	17	38.1	36.9
>50 ml	26	85.3	78.9
Total	43		

In both groups the difference is insignificant and the p value < .001

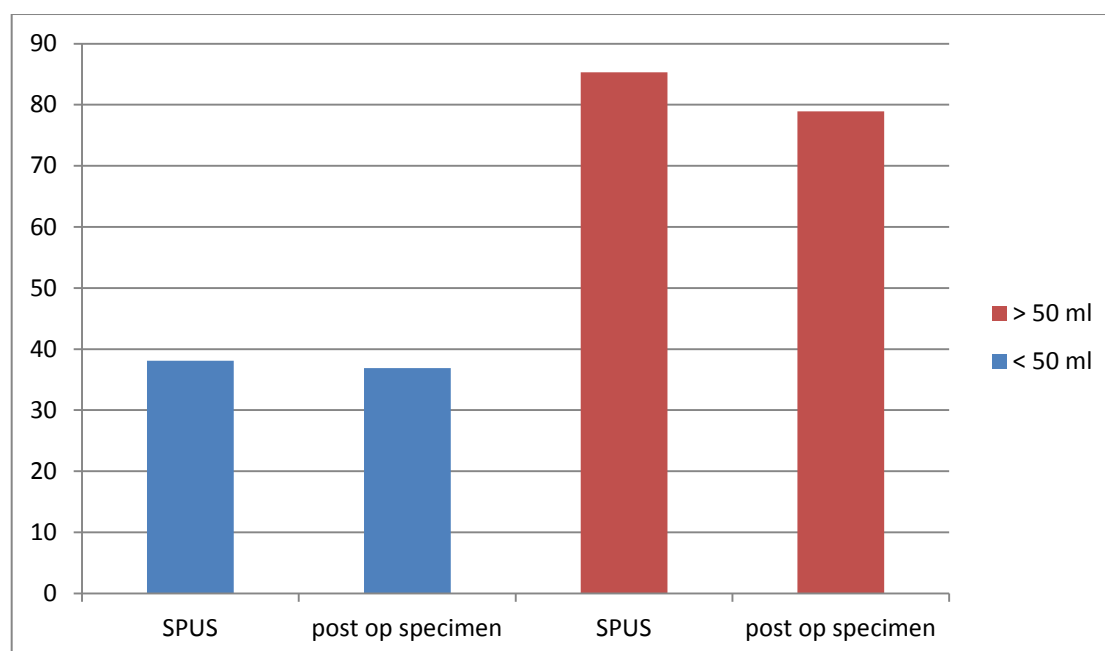


Figure (3): comparison between SPUS and postoperative prostate volume in two group of patients.

Discussion:

Ultrasonography has become an important part of urology in prostate examination as it is noninvasive and safe. Developments in the technology in the recent 20 years enabled this imaging method to be used in the diagnosis, management, and follow-up of prostatic diseases, especially benign prostate hyperplasia.⁽¹⁰⁾

Determination of focal lesions in the prostate and imaging of paranchymal structure can be performed by SPUS.^(10, 11) This modality is also considered as the best in vivo method to calculate the volume of the prostate after TRUS.⁽¹¹⁾

Preoperative prostate volumes are used as a criterion for choosing the operation method like transabdominal open prostatectomy or TURP.

It is also important, as when the time required to resects the adenoma increases, the risk of hemorrhage and TUR of the prostate syndrome increases with larger gland volumes and operative morbidity increases in proportion to gland size during open prostatectomy.⁽¹²⁾

A strong correlation has been reported between prostate weights measured by SPUS and the real prostate weight in specimens excised operatively. However, SPUS is superior to TRUS it doesn't cause discomfort, especially in patients

with anal diseases such as hemorrhoid, anal fissure, and anal fistula, as well as patients with a low pain threshold.⁽¹³⁾

On the other hand, although SPUS may have pitfalls in obese patients, in patients with very full bladders or in those, who cannot fill the bladder adequately, it is a nontraumatic method, and can be easily tolerated by the patients. It has been reported that in patients with benign prostate hyperplasia, there is a strong correlation between the measurements of prostate dimension and volume measured

by SPUS and the real prostate weight in excised specimens.⁽¹⁴⁾

Conclusion and recommendation:

Assessment of prostate volume by SPUS is closely correlated with real prostate volume. Furthermore, it is noninvasive procedure and more comfortable to the patients. We recommend using this method to assess the prostate volume before assigning the interventional method.

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