

ORIGINAL ARTICLE

Frequency of Scrotal Pathologies on Ultrasound Associated with Benign Prostatic Hyperplasia

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ABSTRACT

Background: Men's lower urinary tract symptoms are frequently caused by benign prostatic hyperplasia (BPH), which is the non-cancerous expansion or hyperplasia of prostate tissue. In these patients, an accurate diagnosis of testicular pathologies and the avoidance of testicular infarction are of highest importance.

Duration of study: study was conducted from January 2022, till June 2022.

Place of study: Department of Radiology, Sheikh Zayed medical college and hospital Lahore, Pakistan

Study design: A cross-sectional study.

Objective: To find the frequency of scrotal pathologies on ultrasound in benign prostatic hyperplasia patients

Methodology: A cross sectional study was conducted at Department of Radiology, Sheikh Zayed medical college and hospital Lahore, Pakistan (SZMC). SPSS version 21.0 was used for data analysis. The inclusion criteria for present study considered the enlargement of prostate gland in men with age which is very common. Uncomfortable urinary symptoms, such as a bladder blockage, might be brought on by an enlarged prostate gland. It may also result in issues with the kidney, urinary system and bladder. The exclusion criteria were patients who had any history of previous testicular pathology and men who were uncooperative. Frequency of scrotal pathologies in patients with benign prostatic hyperplasia were calculated by using ultrasound machine Mindray Z5 and Toshiba Xario 100 with linear probe of 7.5-11MHz were used.

Results: In current study 159 men with benign prostatic hyperplasia visiting radiology department for ultrasound were included. Out of 159 men with BPH, 37(23.3%) had epididymal cysts, 24(15.1%) had undescended testis, 18(11.3%) had epididymo-orchitis, 39(24.5%) had epididymitis, 22(13.8%) had microlithiasis, 37(23.3%) had varicocele, 85(53.3%) had hydrocele and 32(20.1%) patients had normal scrotal findings. In patients with no epididymitis mean value of Prevoid was 376 ml and post void were 49 ml and prostate volume was 49 grams. In patients with epididymitis mean value of Prevoid was 377 ml and post void were 48 ml and prostate volume was 46 grams respectively.

Practical implication: This research is very informative for men community regarding urological complications especially about enlargement of prostate gland and its complications.

Conclusion: Our study concluded that, most patients coming with BPH had scrotal pathologies. Hydrocele was most common pathology in patients with BPH.

Keywords: Scrotal Ultrasound, Hydrocele, Varicocele, Ultrasonography, Hyperplasia, Prostate gland, Epididymitis, Microlithiasis

INTRODUCTION

Benign prostatic hyperplasia (BPH) refers to the nonmalignant growth or hyperplasia of prostate tissue and is a common cause of lower urinary tract symptoms in men.^{1,4}Prevalence has been shown to increase with advancing age.²Indeed, the histological prevalence of BPH at autopsy is as high as 50% to 60% for males in their 60's, increasing to 80% to 90% of those over 70 years of age. These include bladder outlet obstruction (BOO), lower urinary tract symptoms (LUTS), and benign prostatic enlargement (BPE).³BPH describes the histological changes, benign prostatic enlargement (BPE) describes the increased size of the gland (usually secondary to BPH) bladder outlet obstruction (BOO) describes the obstruction to flow.⁴BPH is characterized by a proliferation of both the stromal and epithelial cells of the prostate in the transitional zone surrounding the urethra.^{1,7,10}More than 32 million men worldwide have symptoms related to BPH and BPH affects more than 50% of men over the age of 60 years and as many as 90% of men over the age of 70 years.^{1,7,8}

On and ultrasonography teratomas appear as hypoechoic masses with foci of increased echogenicity due to calcifications, which are common.⁵ Lymphoma is one of the most common testicular tumors appreciated in older men. The ultra-sonographic appearance is usually that of an anechoic mass.⁶Testicular microlithiasis (TM) is an unusual condition characterized by calcium deposits within the seminiferous tubules.⁷On ultrasound it is seen as numerous, constant, non-shadowing echogenic foci in the testis.⁸Varicocele is the most common irregular finding in infertile men with subnormal semen. Therefore, we use color Doppler ultrasonography as an alternative to varicocele palpation in infertile men. These cysts can have a range of anatomic origins and can cause a number of genitourinary disorders and

symptoms.⁹ These cysts can cause a variety of symptoms, including urinary tract infection, discomfort, post voiding incontinence, recurrent epididymitis, prostatitis, and hematospermia, as well as infertility.¹⁰

Ultrasonography (USG) is performed with a high-prevalence transducer and doppler modes is the imaging modality of choice for evaluating acute and non-acute scrotal disease.^{11, 12}Many of these diseases including testicular torsion, epididymo orchitis, and intra-testicular tumor have common symptom like pain and differentiation of these disorders is important for determining the appropriate treatment. USG with a high-prevalence transducer helps to better characterize intra-scrotal lesions, and in many instances the findings suggest more specific diagnosis.¹³Preoperative ultrasonography is highly sensitive for distinguishing intra-testicular and extra-testicular lesions.

Scrotal pain is a relatively frequent complaint confronting physicians in an emergency setting, and one that harbors potentially serious implications. Accurate diagnosis of testicular torsion and prevention of testicular infarction are of utmost concern in these patients.¹⁴ Scrotal ultrasound is one of the main diagnostic tools for detection and monitoring of testicular abnormalities in boys.¹⁵

Ultrasound is the modality of choice because it has high resolution for superficial structures including testes.¹⁶ Ultrasound was used to determine whether a mass is solid or cystic, simple or complex and vascular or avascular.

Significance of Study: Current study is very informative for men community regarding urological complications especially about enlargement of prostate gland and its complications. The main causes of prostate gland enlargement include medical disorders such type 2 diabetes, obesity, and heart and circulation disease.

Research gap: Present study do not cover all segments regarding prostate gland enlargement because men experiencing benign prostatic hyperplasia symptoms ought to see a doctor. Men with the following signs and symptoms need to consult a doctor right away.

Rationale of study: The aim of our study was to assess the prevalence of scrotal pathologies on ultra sound associate with benign prostatic hyperplasia.

MATERIAL AND METHODS

It was a cross-sectional study performed to find out the frequency of scrotal pathologies on ultrasound in patients with benign prostatic hyperplasia. It included 159 men with benign prostatic hyperplasia. The duration of data collection was 6 months from January 2022, till June 2022, and data were collected from sheikh Zayed medical college and hospital Lahore Pakistan.

Research design: It was a cross-sectional study.

Population sampling: 159 males were considered

Sample size: n=159 males were studied for duration of 6 months from January 2022 till June 2022 at from sheikh Zaid medical college and hospital Lahore

Inclusion and exclusion Criteria: The inclusion criteria was men with benign prostatic hyperplasia. The exclusion criteria were patients who had any history of previous testicular pathology and men who were uncooperative. Mindray Z5 and Toshiba Xario 100 with linear probe of 7.5-11MHz were used.

RESULTS

Table 1 shows that in this study 159 men with benign prostatic hyperplasia visiting radiology department for ultrasound were included. Out of 159 men with BPH, 37(23.3%) had epididymal cysts, 24(15.1%) had undescended testis, 18(11.3%) had epididymo-orchitis, 39(24.5%) had epididymitis, 22(13.8%) had microlithiasis, 37(23.3%) had varicocele, 85(53.3%) had hydrocele and 32(20.1%) patients had normal scrotal findings.

Table 1: Demographical results

Variables	Frequency Total patients (159)	Percentage
Hydrocele	85	53.5%
Varicocele	37	23.3%
Microlithiasis	22	13.8%
Epididymitis	39	24.5%
Epididymo orchitis	18	11.3%
Undescended testis	24	15.1%
Epididymal cyst	37	23.3%
Normal Scrotal Findings	32	20.1%

Table 2-shows the cross tabulation between pre and post void volume, prostate and epididymitis in which we calculate mean value 49.5750 ± 27.0 with standard deviation. In patients with no epididymitis mean value of Prevoid was 376 ml and post void were 49 ml and prostate volume was 49 grams. In patients with epididymitis mean value of Prevoid was 377 ml and post void were 48 ml and prostate volume was 46 grams.

Table-2: Post Void Volume Pre Void Volume Prostrate Volume(mm) Epididymitis

Post void volume Pre void volume Prostate volume(mm) * Epididymitis			
Epididymitis	Post void volume	Pre void volume	Prostate volume(mm)
NO	Mean	49.5750	376.3500
	N	120	120
	Std. Deviation	27.08923	117.73540
	Minimum	10.00	122.00
	Maximum	229.00	652.00
YES	Mean	48.0769	377.7436
	N	39	39
	Std. Deviation	13.01494	113.73416
	Minimum	13.00	211.00
	Maximum	69.00	605.00
Total	Mean	49.2075	376.6918

N	159	159	159
Std. Deviation	24.36902	116.41093	12.87052
Minimum	10.00	122.00	30.00
Maximum	229.00	652.00	91.40

Table 3-shows the cross tabulation between pre and post void volume, prostate and hydrocele in which we calculate the minimum, maximum, mean value with standard deviation. In patients with no hydrocele mean value of Prevoid was 387 ml and post void were 48 ml and prostate volume was 50 grams. In patients with hydrocele mean value of Prevoid was 367 ml and post void were 50 ml and prostate volume was 47 grams.

Table-3: Post void volume Pre void volume prostrate volume (mm) Hydrocele

Post void volume Pre void volume Prostate volume(mm) * Hydrocele			
Hydrocele	Post void volume	Pre void volume	Prostate volume(mm)
NO	Mean	48.2297	387.0541
	N	74	74
	Std. Deviation	23.73573	122.22289
	Minimum	10.00	122.00
	Maximum	149.00	652.00
YES	Mean	50.0588	367.6706
	N	85	85
	Std. Deviation	25.01635	111.04315
	Minimum	11.00	122.00
	Maximum	229.00	652.00
Total	Mean	49.2075	376.6918
	N	159	159
	Std. Deviation	24.36902	116.41093
	Minimum	10.00	122.00
	Maximum	229.00	652.00

Table 4-shows the cross tabulation between pre and post void volume, prostate and epididymal cyst in which we calculate the minimum, maximum, mean value with standard deviation. In patients with no epididymal cyst mean value of Prevoid was 386 ml and post void were 49 ml and prostate volume was 49 grams. In patients with epididymal cyst mean value of Prevoid was 376 ml and post void were 49 ml and prostate volume was 48 grams.

Table-4: Post void volume pre void volume prostrate volume (mm) Epididymal cyst

Post void volume Pre void volume Prostate volume(mm) * Epididymal cyst			
Epididymal cyst	Post void volume	Pre void volume	Prostate volume(mm)
NO	Mean	49.2541	386.3115
	N	122	122
	Std. Deviation	25.57716	115.06125
	Minimum	10.00	122.00
	Maximum	229.00	652.00
YES	Mean	49.0541	344.9730
	N	37	37
	Std. Deviation	20.18655	116.74913
	Minimum	25.00	122.00
	Maximum	149.00	555.00
Total	Mean	49.2075	376.6918
	N	159	159
	Std. Deviation	24.36902	116.41093
	Minimum	10.00	122.00
	Maximum	229.00	652.00

Table 5-shows the cross tabulation between pre and post void volume, prostate and epididymoorchitis in which we calculate the minimum, maximum, mean value with standard deviation. In patients with no epididymoorchitis mean value of Prevoid was 368 ml and post void were 48 ml and prostate volume was 49 grams. In patients with epididymoorchitis mean value of Prevoid was 442 ml and post void were 52 ml and prostate volume was 48 grams.

Table-5: Post void volume pre void volume prostate volume (mm) Epididymo Orchitis

Epididymo orchitis		Post void volume	Pre void volume	Prostate volume(mm)
NO	Mean	48.7376	368.2837	49.1092
	N	141	141	141
	Std. Deviation	20.38054	113.41135	13.16267
	Minimum	10.00	122.00	30.00
	Maximum	149.00	652.00	91.40
YES	Mean	52.8889	442.5556	48.0833
	N	18	18	18
	Std. Deviation	45.63395	121.84524	10.57223
	Minimum	25.00	224.00	33.00
	Maximum	229.00	652.00	78.00
Total	Mean	49.2075	376.6918	48.9931
	N	159	159	159
	Std. Deviation	24.36902	116.41093	12.87052
	Minimum	10.00	122.00	30.00
	Maximum	229.00	652.00	91.40

DISCUSSION

Our study was designed to determine the prevalence of scrotal pathologies on ultrasound in benign prostatic hyperplasia patients. For the purpose of diagnosis scrotal ultrasound is one of the main diagnostic tools for detection and monitoring of testicular abnormalities in males. A major indication is scrotal pain or abnormal clinical finding. Other indications include testicular inflammation, hydrocele, and varicocele.¹⁷

In current study the attempt was made to determine the significance of scrotal ultrasound in patients with testicular pathologies. Data were collected according to variable of age, solid mass, cystic mass, hydrocele, varicocele, epididymitis and BPH with pre and post void residual volume. Data of 159 patients were collected (100% males) from Department of Radiology, SZMC & Hospital. Arjehansari K, Vises N et al had performed a retrospective study in 72 cases of extra testicular lesions and 48 cases of intratesticular lesions to find out the causes of intra-scrotal disease in which it was reported that hydrocele was the most common pathology.¹⁸

Another study¹³ showed tubercular epididymo-orchitis was diagnosed in 3 patients. Heterogeneous echo pattern with hyperechoic areas, enlarged epididymis and testis with increased vascularity were seen in all cases¹⁰. Another similar study¹¹ was done in which there were 10 patients (14.2%) diagnosed with acute epididymitis. USG features seen were enlarged epididymis in all the patients (100%), increased epididymal vascularity in 9 patients (90%) and altered echogenicity in 9 patients (90%)¹⁴. Other features such as reactive hydrocele and scrotal wall thickening further augment the diagnosis of epididymitis.¹⁹ According to the study conducted⁵, Gray scale and Doppler ultrasound imaging as an accurate means of evaluating diverse scrotal diseases. It permits differentiation between the lesions like torsion that require urgent surgical management from orchitis which can be managed conservatively. The most commonly involved age group was 31 to 40 years (n = 23; 32.9%). Swelling was the most common symptom. On USG, the most common scrotal pathology encountered was hydrocele (n=22; 19.80%) followed by epididymal cyst (n=18; 16.2%), epididymo-orchitis (n=15; 13.60%) and epididymitis (n = 10; 9%). The pathologies were more common on left side (n=48, 43.24%).²⁰ S Thinyu et al. 2009 determined the role of ultrasonography in diagnosis of scrotal disorders. They concluded that The most common cause of scrotal pain was infection. The most common cause of scrotal mass or swelling was extratesticular lesion. US plays an important role in the diagnosis of scrotal disorders and in planning for proper management.²¹ Ultrasonography is the ideal noninvasive imaging modality for evaluation of scrotal abnormalities. It is capable of differentiating the most important etiologies of acute scrotal pain and swelling, including epididymitis and testicular torsion, and is

the imaging modality of choice in acute scrotal trauma. In patients presenting with palpable abnormality or scrotal swelling, ultrasonography can detect, locate, and characterize both intratesticular and extratesticular masses and other abnormalities. In results of our study total number of 159 patients, 39 (24.5 %) had epididymitis. In patients with no epididymitis mean value of Prevoid was 376 ml and post void were 49 ml and prostate volume was 49 grams. In patients with epididymitis mean value of Prevoid was 377 ml and post void were 48 ml and prostate volume was 46 grams.²² Another study⁶ was reported in which eight patients. Seven had left varicocele (87.5%) and one had right varicocele. There were 4 patients with complaints of infertility, all of them with left varicocele¹². Four patients (50%) belonged to the 21 to 30 years age group. USG features were dilated tortuous pampiniform plexus with reflux of blood on Valsalva manoeuvre.²³

CONCLUSION

Our study concluded that, most patients coming with BPH had scrotal pathologies. Hydrocele was most common pathology in patients with BPH.

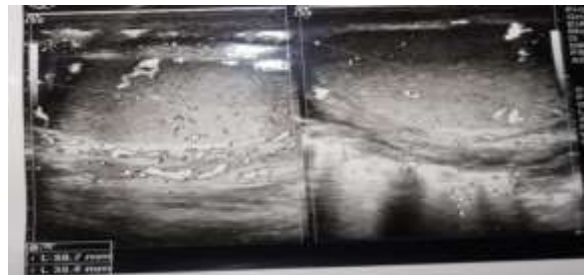


Fig-1: Epididymitis seen in right testis

A heterogeneous area is noted in right testis with increase in internal vascularity and increase in size of testis, minimal hydrocele noted, scrotal wall thickness increased.



Fig-2: Image 2-Right sided scrotal abscesses and epididymo-orchitis are seen in right testis

Usually complex mixed solid/cystic structure, may be isoechoic to the rest of the testis, evidence of epididymitis and evaluation of debris or encapsulation to suggest a pyocoele.



Fig-3: A heterogeneous area is noted in left testis with increase in internal vascularity

Increased vascularity in the right testis and epididymis in keeping with epididymo-orchitis. Right sided hydrocele is also seen. Generalized scrotal wall thickening.

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