



ROLL OF ULTRASOUND IN EVALUATION OF SCROTAL PATHOLOGY

Buddha Raju Surya Rekha¹, Gowtham Krishna jasti^{2*}

¹Assistant Professor of Radio Diagnosis, Sree Balaji Medical College and Hospital,Chrompet,Chennai (Affiliated to Bharath University, Chennai), India.

²Assistant Professor of Radio Diagnosis, Sree Balaji Medical College and Hospital,Chrompet,Chennai (Affiliated to Bharath University, Chennai), India.

ABSTRACT

Due to its ease of use, lack of ionizing radiation exposure, noninvasive nature, reproducibility, low cost, and ease of accessibility, ultrasound (US) is the preferred imaging modality for evaluating scrotal disease. High-resolution US and color Doppler better highlight scrotal and testicular diseases because of the scrotum's superficial anatomy. The genital organs are subjected to damaging ionizing radiation during CT, while MRI is both costly and uncommon. The male genital system is concerned the scrotum and scrotal contents are very much important structures .If any disease affecting the scrotum or scrotal content can affect the fertility directly or indirectly. Scrotal masses may be intratesticular or extratesticular. In detecting and assessing scrotal diseases, high-frequency USG and color Doppler sonography have good sensitivity and specificity. Furthermore, the lack of ionizing radiation, simplicity, wide availability, cost-efficiency, and reproducibility make it a highly important method for scrotal diseases. Sonography, both Grayscale and Color Doppler were found to be 93.33% sensitive in the diagnosis of Scrotal Pathology. The present study concludes that High-Resolution USG along with Color Doppler imaging and Power Doppler should be used as the first imaging modality in the evaluation of Scrotal Pathology.

Key words: Color doppler ultrasound, Color doppler, Epididymis, Testies, Scrotal pathology, High resolution us.

INTRODUCTION

The male genital system is concerned the scrotum and scrotal contents are very much important structures .If any disease affecting the scrotum or scrotal content can affect the fertility directly or indirectly. Scrotal masses may be intratesticular or extratesticular. Most of the intratesticular masses should be considered malignant and extratesticular cystic masses are almost certainly benign, whereas extratesticular solid masses have a malignant rate of 16%, which though being much lower than intratesticular masses, is high enough to be of concern.[1] Most of the patients with abnormalities of the scrotum and scrotal contents frequently present to both surgeons and urologists and the diagnosis of the most of scrotal diseases done by clinical examination. The pathology eluded the

best of clinicians particularly when the hydrocele masked the presence of intratesticular pathology or when the anatomic detail has been lost, a palpable enlarged scrotum may present a perplexing clinical situation for the examining clinicians. It is difficult to distinguish between enlargement of scrotum caused by testicular origin and that caused by diseases of the scrotum itself [2].

Acute scrotal pain is a medical emergency requiring prompt diagnosis and treatment. It is essential to identify and differentiate surgically corrected lesions and abnormalities adequately treated by medical therapy alone. The clinical history plays an important role in identifying causes and clinical symptoms are variable and non-specific and physical examination has similar limitation.

Corresponding Author: - **Dr. Gowtham Krishna jasti** Email: drpebyreddy@gmail.com

Hence for accurate diagnosis imaging of the scrotal structures and testis is necessary.

The scrotal ultrasound, introduced by Miskin and Bain in 1974, it is help for accurate interpretation urologists not only must learn the significance of when is seen on ultrasound image but also must have fundamental understanding of the principles governing the production of images[3-5]. Diagnostic ultrasound has ability to delineate soft tissue and to evaluated the scrotal contents. The aim of the present study is to evaluate efficacy of ultrasonography to differentiated between benign and malignant masses.

MATERIAL AND METHODS:

This was the prospective study carried out in the department of Radio diagnosis Sree Balaji Medical College and Hospital, Chrompet, Chennai, during the June 1997 to 1999. This study comprise 140 unselected patients of different age groups in whom there was clinical suspicion of scrotal pathology.

Sonographic examination was done using state of the art real-time gray-scale ultrasound equipment ALOKA-SSD630 with a 7.5 MHz mechanical transducer. Whenever the deep penetration was required, 3.5 MHz transducer was used.

No patients preparation was necessary in cases of acute scrotal pathologies but in remaining patients preparation of parts was advised. The examination was performed with the patient supine with the thigh's adducted and scrotum supported by a folded towel held

between the upper thighs so as to elevate the scrotum. Penis was placed on the patients abdomen and covered with a towel. This results in minimal exposure of the patient while retaining maximal access to the area of interest. The examination was performed with maximum privacy and consideration. Alternatively the scrotal sac was supported by the examiners gloved hand. A concise history was obtained while scrotum was gently palpated and palpatory method was used to correlate the clinical and ultrasound findings.

Transducer was placed directly on scrotal skin with coupling gel. Copious quantities of coupling gel were applied to scrotal surface. This allowed the operator to glide the transducer through the couplant without actually touching the patient. Scanning was done in longitudinal and transverse oblique plans. 'Window view' was especially important in evaluating the actual painful scrotum. Water bath technique was used for evaluation of scrotal valve. Ultrasound scanning of abdominal was also done by using 3.5MHz and 7.5MHz in order to detect the abdominal metastases.

RESULTS

This study includes 140 cases with 280 hemiscrotums of clinically suspected scrotal pathologies from June 1997 to June 1999. Out of the evaluated 140 cases, 119 patients were having unilateral pathology and 21 patients were having bilateral pathology and 121 hemiscrotums were normal and these 121 hemiscrotums were excluded from the study.

Table 1: Distribution of cases having unilateral and bilateral scrotal pathologies

Side	No. of cases	Percentage
Unilateral	119	85%
Bilateral	21	15%
Total	140	100%

Table 2: Distribution of pathologically proved benign and malignant hemiscrotums according to age group is as follows

Age group In years	Benign		Malignant		Total	
	Number	%	Number	%	Number	%
1-10	4	2.51	0	0	4	2.51
11-20	24	15.10	1	0.63	25	15.73
21-30	48	30.20	1	0.63	49	30.83
31-40	24	5.10	4	2.51	28	17.61
41-50	21	13.21	0	0	21	13.21
51-60	15	9.43	0	0	15	9.43
61-70	14	8.81	0	0	14	8.81
71-80	3	1.87	0	0	3	1.87
Total	153	96.23	6	3.77	159	100

Table 3: Distribution of different benign and malignant lesions on ultrasonography and proved pathologically and surgically

S.No	Scrotal pathology	Sonological diagnosis		Final diagnosis	
		No	%	No.	%
1	Hydrocele	63	39.62	63	39.62

2	Pyocele	5	3.14	3	1.89
3	Haematocele	10	6.29	10	6.29
4	Acute epididymoorchitis	10	6.29	10	6.29
5	Chronic epididymoorchitis	1	0.63	1	0.63
6	Acute epididymitis	4	2.52	4	2.52
7	Epididymal abscess	3	1.89	3	1.89
8	Testicular abscess	2	1.25	2	1.25
9	Periorchitis abscess	4	2.52	3	1.89
10	varicocele	12	7.55	12	7.55
11	Epididymal cyst	10	6.29	10	6.29
12	Testicular malignancy	10	6.29	5	3.14
13	Squamous cell carcinoma	1	0.63	1	0.63
14	Atrophic testis	1	0.63	1	0.63
15	Lipoma of scrotal wall	1	0.63	0	0
16	Undescended testis	5	3.14	5	3.14
17	Torsion of inguinal testes	1	0.63	1	0.63
18	Inguinoscrotal hernia	15	9.43	15	9.43
19	Testicular microlithiasis	1	0.63	1	0.63
	Total	159	100	150	94.34

Total 150 hemiscrotums diagnosed sonographically 150(94.34%) were proved correctly by surgical findings and histopathological confirmations.

Table 4: Distribution of malignant lesions of Scrotum

S.no	Scrotal pathology	No of lesions	
		Numbers	percentage
1	Extratesticular		
	a. Squamous cell carcinoma	1	16.67%
2	Testicular		
	a.Teratoma	2	33.33%
	b.Seminoma	1	16.66%
	c. Embryonal cell carcinoma	2	33.33%
	Total	6	100

Total 6 scrotal malignancies 1(16.67%) was squamous cell carcinoma, 2(33.33%) teratoma, 2 embryonal cell carcinoma (33.33%) and 1seminoma (16.66%).

DISCUSSION

The clinician is often faced with a diagnostic dilemma in the patient with a palpable mass of indeterminate character in the scrotum. Tumours of the testes are frequently misdiagnosed in the initial examination of younger patients. Alternative diagnostic modalities other than physical examination and exploration of scrotum are limited [6].

Imaging studies form a major portion of our diagnostic tools. In most cases, our approach is to make a specific diagnosis or to resolve a question among several diagnostic possibilities. Although in many areas ultrasound has long been used in this traditional fashion, scrotal ultrasound has often been in different diagnostic category. It has been used primarily to confirm a clinically suspected diagnosis[7]. It is important to determine if study significantly affect the final diagnosis and the final therapy. Roelof Van Dijk et al emphasized the use of ultrasound as an adjunct to clinical examination and to confirm a clinical impression[8-9].The main diagnostic

problem in scrotal disorder is to distinguish between malignant and benign disease. Both ultrasonography and clinical examination had high value of sensitivity and specificity in testicular cancer [10].

In the present study 140 patients presented with either unilateral and bilateral scrotal pathology, were evaluated by sonography. Incidence of non-malignant condition was on higher side than malignant. Majority of the patients presenting with scrotal pathology were found to be of age group between 21-30 years and common age group for testicular malignancy was 31-40years(4 hemiscrotums) [11]. In the present study, 48 out of 144 benign masses were in the age group 21-30 years. The maximum number of benign and malignant masses were in the age group of 11-40 years and 51-70 years, that is comparable with B. Kromann-Anderson (Age group 15-75). All malignant cases were in the age 18-40years, again consistent with the Kenneth.D³⁰(25-35years),J.A. Guthrie¹⁹(20-40years).The total percentage of testicular malignancy in the present study was 3.14%.Love and Bailey William

G.Horstman stated that testis tumour represent only 1% to 2% of malignant tumours,

In our study, the most common benign lesions were hydrocele, which appears as anechoic collection in layers of tunica vaginalis surrounding the anterolateral portions of testis. In chronic hydrocele internal echoes were due to presence of cholesterol and tyrosine crystals, which were proved cytologically [5]. Kenneth D. Krone (1985) stated that in the setting acute and chronic infection, it may be impossible to determine whether such abnormalities represent an uncomplicated hydrocele or infected one with pyogenic debris or haemorrhage. There were 5 cases of congenital hydrocele and one infantile hydrocele. Congenital hydrocele communication with the peritoneal cavity, infantile hydrocele not communicated with peritoneal cavity. Next most common group of benign lesions occurred in our study was inguinoscrotal hernia or swelling. There were 14 (8.81%) cases, 4 cases were with inguinoscrotal hernia with hydrocele, 3 were obstructed, one with inguinoscrotal hernia with epididymal cyst with varicocele and one with inguinoscrotal hernia with hematocele [6]. On ultrasonography, hernia appears as complex mass separate from testicle and bowels were easily identified by the presence of haustration of large bowel and valvulae connivents of small bowel within the scrotum and by visualization of peristalsis in non obstructed hernia [9-10].

Robert Lee Bree and Hedvig Hricak stated that ultrasound can contribute to the diagnosis whenever there is any doubt. Valvulae hesturation of small and large bowels can be easily identified conforming the presence of bowel within the scrotum. About 5% inguinal hernia's were associated with vaginal hydroceles of the same site (Love and Bailey). Thus identification of both hernia and

hydrocele gives valuable information to surgeons so as to extend the incision [2].

In the present study of the total 12 cases of varicoceles 10 (83.33%) were on the left side and 2 (16.67%) were on the right side. Robert L. Bree (1986) explained a predominance of varicoceles on the left side owing to venous drainage through the left renal vein. The left renal vein is subject to compression by the abdominal aorta and superior mesenteric artery, additionally left internal spermatic vein drains into the left renal vein at right angles. In all 12 cases abdominal scanning was done to rule out any retroperitoneal mass. William G. Horstmann (1997) stated that primary unilateral varicocele are rare, when one is encountered the possibility of retroperitoneal mass obstructing the right spermatic vein should be investigated [5]. By this we can say ultrasound has become a valuable tool in the diagnosis of the scrotal abnormalities and sonography was found to be a safe, simple, rapidly performed modality with high accuracy in diagnosis of scrotal pathology [11].

CONCLUSION

Ultrasound is the imaging technique of choice for all scrotal problems. The maximum diagnostic yield is in the early demonstration of testicular cancer, particular in those patients who have not had the diagnosis made on clinical grounds. Ultrasonography is highly sensitive but not specific in diagnosing testicular tumours. Any young male seeking medical advice with scrotal symptoms and signs should have an ultrasound scan. The present study concludes that High-Resolution USG along with Color Doppler imaging and Power Doppler should be used as the first imaging modality in the evaluation of Scrotal Pathology.

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