



ULTRASOUND EVALUATION OF SCROTAL PATHOLOGIES

Radiology

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ABSTRACT

Objective: To assess role of high frequency ultrasonography and color Doppler in diagnosis of scrotal diseases.

Material and methods: A prospective study of 108 patients who presented with complaints of scrotal pathology and was referred from various clinical departments for ultrasound examination. Prior to examination clinical data and verbal informed consent of patient were obtained. Patients were examined on SAMSUNG ACCUVIX ULTRASOUND Machine with linear array high frequency probe (6-7-9 MHz) at Department of Radiodiagnosis PDU civil hospital Rajkot from August 2017 to August 2018.

Results: Highest number of cases were in the age group of 31-40 years (21, 19.5%) and minimum in 71-80 years (02, 1.8%). Commonest clinical presentation was combination of symptoms like, scrotal swelling and pain as in 26 cases (24%), followed by scrotal swelling, pain and fever in 23 cases (21.2%). The maximum diseases are inflammatory (56, 51.8%) followed by inguinoscrotal hernias (13, 12%), congenital (9, 8.3%). The testicular torsion was present in 4 (3.7%) cases. Out of inflammatory pathologies Pyocele (26.7%), Hydrocele (19.6%), Epididymo-orchitis while minimum of Epididymitis (1.8%). The echotexture changes in epididymo-orchitis were comprised of hypoechoic (50%) changes as well as isoechoic changes (50%). Most of the pyocele were presented with heterogeneous echotexture because of multiseptated complex structure. In almost all the cases (100%) of epididymitis and epididymo-orchitis and funiculitis the vascularity was highly increased while in testicular torsion vascularity was absent on color Doppler. In testicular neoplasms, non seminomatous germ cell tumors were maximum (4, 57%) then seminoma and minimum were scrotal wall malignancies (1, 14.2%). The nonseminomatous germ cell tumors were hyperechoic, whereas seminomas were predominantly hypoechoic. Present study shows a low sensitivity (76%) and very low specificity (37%) of clinical examination, whereas high frequency ultrasound is highly sensitive (98%) and specific (100%) in diagnosing scrotal pathologies.

Conclusion: The high frequency ultrasound is highly sensitive and specific as compared to clinical findings in diagnosis of scrotal pathologies and has role in planning for proper management.

KEYWORDS

INTRODUCTION

The scrotum is a superficial structure separated by midline septum, with each half of scrotum containing testis, epididymis, lower part of spermatic cord. Symptoms and clinical examination findings of scrotal diseases are usually overlapping and variable. It is often difficult to decide whether a palpable scrotal mass is arising from testes or from extra testicular elements. Ultrasonography is a very useful diagnostic tool for scrotal pathology as it does not deliver radiation to gonad while CT scan does. It is rapid, realtime, inexpensive, widely available while MRI is costly and not readily available. That's why ultrasonography is the first choice of investigation in scrotal diseases. Doppler ultrasonography has great role in differentiating testicular torsion from other acute inflammatory scrotal diseases which can help in management decision.

OBJECTIVES

To assess role of high frequency ultrasonography and color Doppler in diagnosis of scrotal diseases. To evaluate sensitivity, specificity and accuracy of high frequency and color Doppler ultrasonography in comparison with clinical diagnosis.

MATERIALS AND METHODS

A prospective study of 108 patients who presented with complaints of scrotal pathology and was referred from various clinical departments for ultrasound examination. Prior to examination clinical data and verbal informed consent of patient were obtained. Patients were examined on SAMSUNG ACCUVIX ULTRASOUND Machine with linear array high frequency probe (6-7-9 MHz) at Department of Radiodiagnosis PDU civil hospital Rajkot from August 2017 to August 2018.

RESULTS

After clinical follow up of 108 patients, the following results were obtained. The patients ranged in age from 1 year to 80 years. Highest number of cases were in the age group of 31-40 years (21, 19.5%) and minimum in 71-80 years (02, 1.8%). Commonest clinical presentation was combination of symptoms like, scrotal swelling and pain as in 26 cases (24%), followed by scrotal swelling, pain and fever in 23 cases (21.2%). The maximum diseases are inflammatory (56, 51.8%) followed by inguinoscrotal hernias (13, 12%), congenital (9, 8.3%). The testicular torsion was present in 4 (3.7%) cases. Out of inflammatory pathologies Pyocele (26.7%), Hydrocele (19.6%), Epididymo-orchitis while minimum of Epididymitis (1.8%). The echotexture changes in epididymo-orchitis were comprised of hypoechoic (50%) changes as well as isoechoic changes (50%). The size of testis was increased in 5 cases (50%) of epididymo-orchitis. Most of the pyocele were presented with heterogeneous echotexture because of multiseptated complex structure. In almost all the cases (100%) of epididymitis and epididymo-orchitis and funiculitis the vascularity was highly increased while in testicular torsion vascularity was absent on color Doppler. (table:1). In testicular neoplasms, non seminomatous germ cell tumors were maximum (4, 57%) then seminoma and minimum were scrotal wall malignancies (1, 14.2%). The nonseminomatous germ cell tumors were hyperechoic, whereas seminomas were predominantly hypoechoic. (Table:2) After comparing the ultrasonography with clinical examination in differentiating scrotal pathology as either intra or extra testicular, the present study reveals that the ultrasound is clearly superior. The incidence of extratesticular pathologies is much higher than the intratesticular pathologies. In extratesticular pathologies pyocele constituted maximum number followed by hydrocele. Present study shows a low sensitivity (76%) and very low

specificity(37%) of clinical examination, whereas high frequency ultrasound is highly sensitive(98%) and specific(100%) in diagnosing scrotal pathologies.(table:3)

Table:1 High Frequency Grey scale and Color Doppler appearance of Inflammatory Scrotal Pathologies

Sr.No	Diseases	Cases (%)	GREY SCALE						COLOUR DOPPLER		
			HYPERE C-HOIC	HYPOEC-HOIC	ISOECH O-IC	HETEROG -ENOUS	SEPTA T-ED	INCREA SE SIZE	INCREASE VASCULA RITY	DECREASE VASCULA RITY	NORMAL VASCULA RITY
1	Epididymitis	1(1.8)	-	1	-	-	-	1	1	-	-
2	Orchitis	6(11)	-	3	3	-	-	6	6	-	-
3	Epididymorchitis	10(17.8)	-	5	5	-	-	10	10	-	-
4	Funiculitis	2(3.6)	-	2	-	-	-	2	2	-	-
5	Hydrocele	11(19.6)	-	11	-	-	-	-	-	-	-
6	Scrotal wall abscess	2(3.6)	-	2	-	-	-	-	2	2	-
7	Cord filariasis	2(3.6)	-	2	-	-	-	-	-	-	-
8	Inguinal abscess	2(3.6)	-	2	-	-	-	-	2	2	-
9	Pyocele	15(26.7)	2	-	-	13	15	-	-	-	15
10	Epididymorchitis with Pyocele	5(8.9)	-	5	-	-	-	-	5	-	-
		56 (100)									

Table :2 HIGH FREQUENCY ULTRASONOGRAPHIC APPEARANCE OF TESTICULAR MALIGNANCIES

	Non seminomatous germ cell tumor [Cases (%)]	Seminomas [Cases (%)]
normal size	-	-
increased size	4(100)	2(100)
highly hypoechoic	-	1(50)
slightly hypoechoic	-	1(50)
isoechoic	-	-
hyperechoic	4(100)	-
cystic component	1(25)	-
Echogenic foci	1(25)	1(50)
homogenous	-	1(50)
inhomogenous	4(100)	1(50)
well defined margin	2(50)	-
irregular poor margin	2(50)	2(100)

Table :3 COMPARISON OF ULTRASOUND AND CLINICAL EXAMINATION IN DIAGNOSIS OF SCROTAL PATHOLOGIES

ULTRASOUND			
ULTRASOUND DIAGNOSIS	FINAL DIAGNOSIS		TOTAL
	POSITIVE	NEGATIVE	
POSITIVE	98	0	98
NEGATIVE	2	8	10
TOTAL	100	8	108
CLINICAL EXAMINATION			
CLINICAL EXAMINATION	FINAL DIAGNOSIS		TOTAL
	POSITIVE	NEGATIVE	
POSITIVE	76	5	81
NEGATIVE	24	3	27
TOTAL	100	8	108

DISCUSSION

The majority of cases were of reproductive age group(21-40years). The presenting complaints were fever, scrotal pain, scrotal swelling, trauma, infertility, absence of testis in hemiscrotum; out of which commonest was combination of scrotal pain with swelling. In this study pathologies detected were inflammatory, congenital, neoplastic,infertility,trauma,hernia,torsion and epididymal cyst. The majority of inflammatory pathologies have decreased echogenicity with raised vascularity. Some inflammatory pathology increase vascularity with normal gray scale findings. Testicular neoplasms have enlarged testis with seminomas have homogenous hypoechoic echotexture whereas nonseminomatous germ cell tumor presenting as inhomogenous echotexture, irregular margins,variable cystic and echogenic components and raised vascularity. All neoplastic pathologies were confirmed by histopathological examination. The sonographic diagnosis was comparable to histopathology in all cases except one case of scrotal wall malignancy which was diagnosed as scrotal wall malignancy. Varicocele were diagnosed accurately. A varicocele is considered if 2 or more veins with diameter >2mm with accentuation of flow on Valsalva manuvre. Two cases of traumatic pathology,one was of Hematocele and other was inguinal hematoma following vasectomy.The ultrasound finding of hypoechoic testis with decreased or absent flow lead to diagnosis of testicular torsion and salvage of testis; clinical examination was only 25% whereas ultrasound was 100% sensitive for torsion. Inguinoscrotal hernias were correctly diagnosed with bowel loop appeared as anechoic mass

with valvulae or haustrations and detection of peristalsis. The diagnosis of obstructive hernia was made in one case on basis of nonperistaltic , dilated ,edematous bowel loop and surrounding free fluid in scrotum. The clinical examination was highly unreliable in diagnosing pathologies where testes were obscured by extratesticular lesions,while high frequency ultrasound was highly sensitive(98%) and specific(100%). The ultrasound was more accurate in differentiating testicular from extratesticular pathologies as compare to clinical examination.

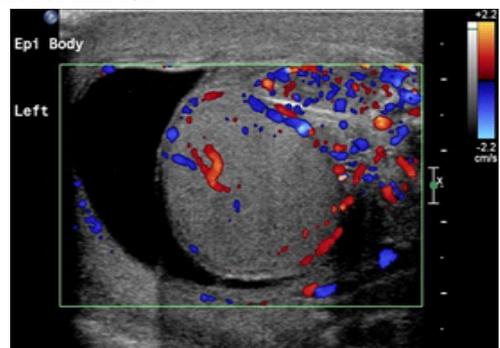


Figure 1 Epididymo-orchitis with hydrocele showing Increased flow on color Doppler.



Figure 2 Pyocele showing multiple hyperechoic septae with internal echoes.

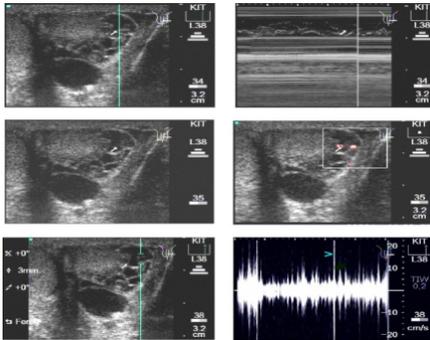


Figure 3 Filariasis, M mode, Power Doppler, Pulse wave showing movement of Filarial worm (Filarial Dance sign)



Figure 4 Seminoma Testis showing testis parenchyma is replaced by lobulated hypoechoic masses.

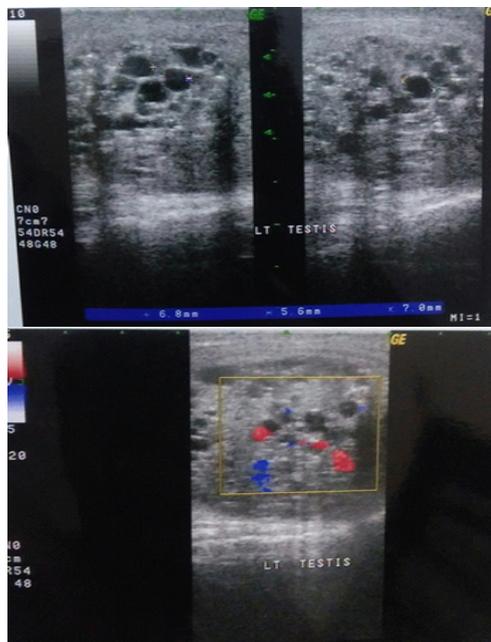


Figure 5 Non Seminomatous Germ cell Tumor showing Heterogenous echotextured lesion with cystic areas within, colour Doppler showing raised vascularity.

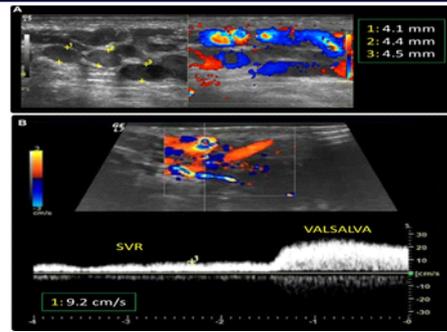


Figure Varicocele showing dilated venous channels of pampiniform plexus of veins with augmented filling and reflux on Valsalva Maneuver

CONCLUSION

The high frequency ultrasound is highly sensitive and specific as compare to clinical findings in diagnosis of scrotal pathologies. It can accurately differentiates testicular and extratesticular pathologies. The ultrasound findings influenced the course of management (surgical or conservative), surgical approach (inguinal or scrotal) in scrotal pathologies. It evolved as a highly reliable tool for diagnosing scrotal and testicular pathologies.

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