



A STUDY ON ROLE OF CT AND MRI IN SCROTAL PATHOLOGY

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ABSTRACT

This study will be an effort in establishing the role of High frequency Ultrasound and Color Doppler as a primary investigating modality in accurately diagnosing different scrotal pathologies 100 cases of scrotal pathology were studied using CT and MRI in our institution, during the period October 2009 to September 2011, were included in this study Out of 100 cases, 35 cases had pathology bilaterally, unilaterally in 59 cases. Out of 59 cases of unilateral side involvement, 27 cases of involvement were on right side, 32 cases involvement was on left side MRI is highly sensitive tool in characterization of testicular tumours as compared to ultrasound. CT is the imaging modality of choice for detecting metastatic deposits and also useful in early diagnosis of cases like fournier's gangrene with evaluation of the extent of the disease.

INTRODUCTION

Until the advent of ultrasonography and its application to scrotal imaging, diagnosis of scrotal pathologic conditions traditionally has been based upon the clinical history and physical examination [1].

This study will be an effort in establishing the role of High frequency Ultrasound and Color Doppler as a primary investigating modality in accurately diagnosing different scrotal pathologies. High frequency gray scale ultrasonography enables only in, identification of morphological alterations that are associated with scrotal disorders

MRI is noninvasive & does not deliver radiation. MRI provides better delineation of tumor and its extent than ultrasound. It helps in better delineation of borders, cystic components and tissue signal intensities which help in preoperative characterization in cases of testicular masses and may be helpful if clinical and sonographic assessments cannot differentiate an intra-testicular mass from an extra testicular masses [2,3].

CT remains the imaging technique of choice in testicular cancers and their staging (metastasis) and in cases like fournier's gangrene. This study is performed to evaluate scrotal pathology with reference to CT and MRI in scrotal pathology as an adjunct.

METHODOLOGY

In this series, 100 cases of scrotal pathology were studied using CT and MRI in our institution, during the period October 2009 to September 2011, were included in this study. These patients were referred to our department for scrotal ultrasonography and Doppler study by department of Urology and department of Surgery of our institution.

CT: TOSHIBHA Auklet single slice spiral CT

MRI: GE Sigma EXCITE 0.2T open magnet.

Scanning technique: - Scanning was routinely performed in supine position, after elevating scrotum using a towel draped over thighs, and the penis is placed on the patient's abdomen and covered with a towel. Both hemiscrotum was examined in transverse, saggital and oblique planes. Scanning was also done with patient position in upright and during performing Valsalva maneuver. Additional scans of spermatic cord in region of scrotal neck and

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inguinal canal region were obtained in special circumstances: Undescended testis, encysted hydrocele of cord, and varicocele.

MRI Scans was performed on GE Sigma EXCITE 0.2T open magnet with the patient in the supine position.

Axial T1 FSE,

Axial T2 FSE,

Coronal T1 FSE,

Coronal T2 FSE were taken.

CT SCANS were done on TOSHIBHA Auklet single slice spiral CT.

And the scrotal scan was done from iliac crests through perineum for scrotum and

Routine abdominal CT was performed for screening of secondaries in cases of tumors.

RESULTS

Table 1. clinical presentation frequency of symptoms

Sl.No	Symptoms	No of Cases
1.	Pain and Scrotal Swelling	14
2.	Pain, Swelling and Fever	12
3.	Scrotal Swelling	36
	Unilateral Swelling	27
	Bilateral Swelling	9
4.	Pain in scrotum	28
	Acute onset	12
	Chronic onset	16
5.	Infertility	4
6.	Trauma	3
7.	Dysuria	3
8.	Discharging wound on scrotal skin	3
9.	Pain abdomen	4

Various clinical presentations as depicted in table-2. Most of the cases Clinically presented with combination of multiple symptoms. Combination: Commonest clinical presentation was scrotal swelling, as in 36 cases (33.6%)(Out of which 27 were unilateral and 9 were bilateral.) Combination of pain, swelling and fever in four cases (11.2%).

Table 2. Scrotal and Testicular Diseases Types of Pathology Detected

Sl.No	Pathology	No of Cases	% of Cases
1	Inflammatory Disease	32	32
2	Infertility	4	4
3	Congenital Lesions	10	10
4	Trauma	4	4.1
5	Swelling	35	35
6	Neoplastic	3	3
7	Others	12	12

Out of 100 cases, 35 cases had pathology bilaterally, unilaterally in 59 cases. Out of 59 cases of unilateral side involvement, 27 cases of involvement were on right side, 32 cases involvement was on left side.

Table 3. MRI Evaluation of Testicular Masses

Pt no	Age	Signal homogeneity	Low signal	Necrosis	Hemorrhage	Capsule	Septae	Histopathological diagnosis
1	24	Absent	Absent	Present	Present	Present	Absent	Immature teratoma with malignant transformation of left Testis.
2	30	Present	Present	Absent	Absent	Absent	Present	Seminoma of right Testis
3	26	Absent	Absent	Present	Absent	Present	Absent	Teratocarcinoma of Right Testis

Heterogenous signal with areas of necrosis were seen in 2 of 3(66.6%) cases, Homogenous signal was noted in 1 of 3(33.3%) cases, Hemorrhage and Capsule was noted in 2 of 3(66.6%) cases, Septations were seen 1 of 3(33.3%) cases.



DISCUSSION

In our study, we examined 56 cases of non-inflammatory scrotal swellings (34%), out of which 35 cases (62.5%) presented with only swelling, and 14 cases (25 %) presented with pain with swelling. In all 14 cases of scrotal swellings associated with pain, the pain was of low intensity and mild dragging in character, which helped to differentiate inflammatory swellings from non-inflammatory swellings. Of 56 cases of non-inflammatory scrotal swellings, 3 cases were neoplastic lesions; remaining 53 cases were non-neoplastic swellings.

The 3 cases of neoplastic swellings were germ cell tumor, one of which was histopathologically confirmed to be seminoma. Other two were histopathologically confirmed as teratocarcinoma. These findings are in similarity to previous studies by Grantham et al [4] and Schwerk et al [5]. Seminoma case showed well defined hypoechoic mass involving right Testis. It showed increased vascularity on color Doppler study. Other 2 cases turned out to be teratocarcinoma. Both of them showed heterogeneous mass with areas of cystic degeneration and small calcifications and increased vascularity was also noted in the masses.

One of the patients had distant metastases in lungs and retroperitoneum. Other patient had a metastatic deposit at the bifurcation of iliac vessels on the left side. Heterogeneous signal with areas of necrosis were seen in 2 of 3(66.6) cases. Homogeneous signal was noted in 1 of 3(33.3) cases. The presence of a relatively homogeneous testicular mass of low signal intensity on T2-weighted images with septations was considered indicative of a seminomatous lesion.

On the other hand, a markedly heterogeneous mass with areas of necrosis or haemorrhage was characterized as a nonseminomatous lesion. These results showed that MRI was having 100% sensitivity and positive predictive value in characterization of Testicular tumours. CT scan showed 3 cases of metastasis. One had distant metastasis to lungs, liver and retroperitoneum. One of them had metastasis to retroperitoneum and another showed a metastatic deposit in bifurcation of left iliac vessels. Of remaining 53 cases, pathology was seen in

both hemiscrotum in 15 cases, unilateral in 38 cases. So totally 56 pathologies are detected. Among non-neoplastic scrotal swellings, hydrocele is the commonest pathology noted 40 cases (47%). Out of 40 cases, 38 cases were primary vaginal hydrocele (95%), 2 cases were encysted hydrocele of cord (5%). Out of 40 cases, hydrocele was noted unilaterally in 31 cases, bilateral in 9 cases. These findings are in similarity to previous studies of Arger et al [6], and Willscher et al [7].

All cases of hydroceles appeared as collection of clear fluid between two layers of tunica. In encysted hydrocele of cord, the collection of clear fluid along spermatic cord appeared as anechoic lesions adjacent to spermatic cord that moves with gentle traction to cord. In present study, we noted 8 cases of Inguino scrotal hernia in association with hydrocele. On High-frequency US scan, there was a hernial sac in the inguinal region, extending up to upper pole of testis with bowel loops within the sac.

CONCLUSION

MRI provides better delineation of borders, cystic components and tissue signal intensities of the testicular masses. Thus useful for further characterization of testicular masses. CT is a useful modality for screening of patients with testicular cancers for secondaries and also useful in staging of the disease. CT is also useful modality in early diagnosis of Fournier's gangrene and evaluation of its extent.

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CONFLICT OF INTEREST: Nil

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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