



ROLE OF USG AND CT SCAN IN EVALUATION OF RIGHT ILIAC FOSSA MASS

Radiology

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ABSTRACT

Right iliac fossa(RIF) is considered 'Temple of surprises' as various pathologies of different organs occur here. Imaging has proven to be pivotal in the diagnostic workup of such patients. USG is the initial screening modality of choice as it is quick, inexpensive & does not carry risk of radiation. Though it identifies the pathology in right iliac fossa, it cannot accurately find the organ of origin & its impact on adjacent structures. High resolution multidetector CT scan provides rapid image acquisition in multiple planes in a short period of time and thus shows the exact location of the lesion but it has a major drawback of radiation.

METHOD: Total 87 patients presenting with right iliac fossa mass were evaluated. All patients were subjected to USG & CT scan. Diagnosis was made based on USG & CT features and also using clinical correlation.

RESULTS: 42 patients (48.3%) were males and 45 (51.7%) were females. The age of the patients ranged from 6 years to 78 years. The most number of cases were of gynecological origin accounting for 26.4% cases in females and appendicular origin accounting for 23.8% in males. Diagnosis was made easy by categorizing the lesions into extraperitoneal & intraperitoneal according to location and neoplastic, infective, inflammatory, traumatic & nonspecific according to etiopathology.

CONCLUSION: USG is modality of choice for superficial lesions such as undescended testes, foreign body, incisional hernia, cysticercosis and lymph nodes. CT scan is more sensitive than USG for rest of the lesions such as appendicular pathologies, bowel pathologies, gynaecological lesions, psoas abscess and lesions extending to RIF; however, CT should be used judiciously due to radiation risk and should be avoided in children unless necessary.

KEYWORDS

Right iliac fossa, USG, CT scan,

INTRODUCTION

Right iliac fossa is the lower most and lateral most quadrant on the right side of abdomen. Right iliac fossa is virtual pandora box that pops up with various pathological conditions which are either confined to this corner or encroach towards it. Among the various quadrants of abdomen, the RIF enjoys the pride of place as far as incidence of mass per abdomen is concerned. It is a diagnostic dilemma to a radiologist to determine the presence of mass, organ of origin, to characterize the mass and its impact on adjacent organs. Presently diagnostic radiology has emerged with various imaging modalities including CT, MRI, radioisotope and interventional studies which has changed the scenario of imaging completely, but USG has its unique position as it is quick, non-invasive, inexpensive without radiation. These advantages have enabled it rightly be labelled as initial imaging modality in this regard. The patients presenting with right lower quadrant pain having a mass are a diagnostic problem and ultrasound is the imaging modality of first choice.^[1] It is a par excellent modality to confirm the mass, to categorize it, to know the origin of the mass & probable etiopathology of the mass. Ultrasound is a handy tool for diagnostic & therapeutic interventions. It has been a boon to the pregnant patients by the virtue of lacking radiation risk. Doppler interrogation of lesions has added advantage to know the vascular status of lesion^[2,3]. Apart from that it attempts to give information of viability of tissue and neoangiogenesis.³ It is an adjunct to the gray scale imaging in an endeavour to reach diagnosis.^[2] Though USG can be used as initial & screening method to identify the pathology in right iliac fossa, it cannot accurately find the organ of origin & its impact on adjacent structures. Inherent bowel gas is considered a major drawback which can obscure the important findings. It has limited resolution in obese patients due to lack of deep penetration by ultrasound. USG is operator dependant and requires a skilled operator.

High resolution multidetector CT scan provides rapid image acquisition in multiple planes in a short period of time and thus can show the exact location of the lesion. CT imaging provides both good soft tissue resolution (contrast) as well as high spatial resolution so boney pathologies can be detected well. A combined approach with ultrasonography and CT scan is particularly helpful as an area of interest can be delineated^[4]. Contrast enhanced multiphase CT has enabled us to identify and characterize the lesion excellently, especially liver lesions and lesions of small bowel. Use of intravenous contrast and positive oral

contrast in study of bowel helps us to decide whether the lesion is intraluminal, intramural or extramural defining the local & distant spread of any pathology but it has a drawback of radiation so it should not be performed in children without absolute need and it is contraindicated in pregnant patients. "CT is considered the most appropriate modality for adults with right lower quadrant pain. Ultrasound is the most appropriate imaging modality for assessing right lower quadrant pain in children and in pregnant patients.^[5]

Patient preparation is required prior performing enhanced CT scan of abdomen. It also needs use of contrast media for better depiction of pathology to which patient can be allergic resulting in serious hazards. CT scan is not thoughtful for follow up studies as repeated use of contrast media can cause nephro genic fibrosis whereas ultrasound is best modality for follow up & screening of patients.

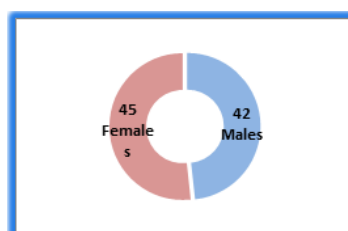
METHOD AND MATERIALS

This study aims at diagnosing pathologies that present as mass in RIF in the department of Radiodiagnosis of SBKS Medical Institute & Research Centre and Dhiraj general hospital, Vadodara. The study is performed using GE Logiq P5 and GE Logiq P9 USG machines and Siemens Emotion 16 slices CT scanner.

Patients referred to the radiology department for USG-Abdomen and/or CT scan of Abdomen and found to have right iliac fossa mass, follow up of already diagnosed cases of right iliac fossa mass were included in the study.

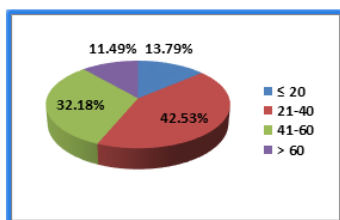
OBSERVATION & RESULTS

Chart 1: Sex wise distribution of cases of RIF mass



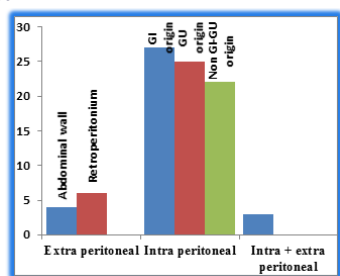
In this study, the male to female ratio for lesions in RIF presenting as mass is almost equal. Out of 87 patients, 45 patients (51.7%) are female and 42 patients (48.3%) are male.

Chart 2 : Age wise distribution of cases of RIF mass



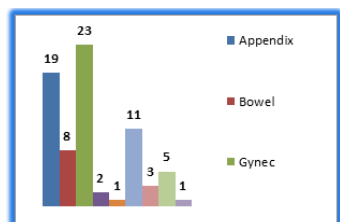
Maximum patients presenting with mass in RIF belong to age group of 21-40 years (42.53%), followed by 41-60 years, 0-20 years and >60 years. Thus in this study, RIF lesions are more common in adult patients, followed by children and elderly patients.

Chart 3 : Categories differentiating Right iliac fossa mass with their incidence



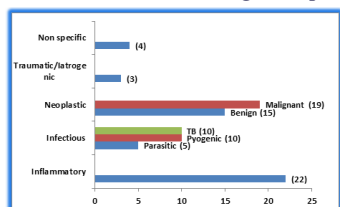
Location of RIF masses can be categorized in extraperitoneal, intraperitoneal & intra + extraperitoneal. In this study, out of 87 patients, 10 patients (11.5%) had extraperitoneal lesions, 74 patients (85 %) had intraperitoneal lesions and 3 patients (3.4%) had lesions involving both extraperitoneal & intraperitoneal compartments.

Chart 4 : No. of cases according to differential diagnosis of right iliac fossa mass



In this study, lesions presenting with mass in RIF in descending order are as follows :Gynecological lesions (26.4%), Appendicular pathologies (21%), Lymph nodes (16%), Lesions whether intra or extraperitoneal extending into RIF (12.6%), Bowel pathologies (9.1%), Psoas abscess (5.7%), Cysticercosis (3.4%), Undescended testes, Foreign body (1.1%), Incisional hernia (1.1%)

Chart 5 : Incidence of RIF mass according to etiopathology



Etiopathologically, RIF masses are categorized into 5 categories: Inflammatory, Infectious, Neoplastic, Traumatic/Iatrogenic and nonspecific. In this study, out of 87 cases, 22 patients (25.28%) had inflammatory lesions, 25 patients (28.7%) had infective lesions, 34 patients (39%) had neoplastic masses. Thus neoplastic lesions were found most common to present as mass in RIF, followed by infectious lesions, inflammatory lesions, lesions with nonspecific cause and traumatic/iatrogenic lesions. Neoplastic lesion can be benign or

malignant. In this study, there were 19 cases (21.8 %) of malignant and 15 cases (17.2%) of benign neoplastic lesions. Infectious lesions can be due to pyogenic, tuberculous or parasitic infections. 10 cases (11.5%) were found each of pyogenic and tuberculous infections. 5 cases (5.7%) had parasitic

Chart 6 : Sensitivity of USG and CT scan in evaluation of different pathologies

Pathology	USG	CT scan
Appendicular pathologies	88.8 %	100 %
Lesions extending into RIF	63.3 %	100 %
Bowel pathologies	75 %	87.5 %
Gynecological lesions	87 %	95.6 %
Psoas abscess	80%	100%
Undescended testes	100%	100%
Foreign body	100%	100%
Incisional hernia	100%	100%
Cysticercosis	100%	-
Lymph nodes	100%	100%

In this study USG was 100% sensitive in cases of undescended testes, FB, incisional hernia, cysticercosis & lymph nodes. Sensitivity of USG in identifying appendicular pathologies, gynecological lesions, psoas abscess, bowel pathologies and lesions extending to RIF was 88.8 %, 87%, 80%, 75% & 63.3% respectively. Regarding sensitivity of CT scan, in my study CT was 100% sensitive in cases of appendicular pathologies, psoas abscess, undescended testes, FB, incisional hernia and lesions extending to RIF. Thus in identifying superficial lesions such as undescended testes, FB, incisional hernia, cysticercosis and lymph nodes, USG was as sensitive as CT scan. CT scan was more sensitive than USG for rest of the lesions such as appendicular pathologies, bowel pathologies, gynecological lesions, psoas abscess and lesions extending to RIF.

CONCLUSION

Though ultrasound is not as sensitive as CT scans, the lack of radiation exposure and potential earlier time to diagnosis and disposition suggest that it should be attempted prior to exposing patients to radiation. The judicious use of CT will improve the preoperative diagnostic accuracy and avoid clinical mismanagement or unnecessary exploratory laparotomies thus improving quality of patient care.

CASE IMAGES

Case - 1 : Acute appendicitis

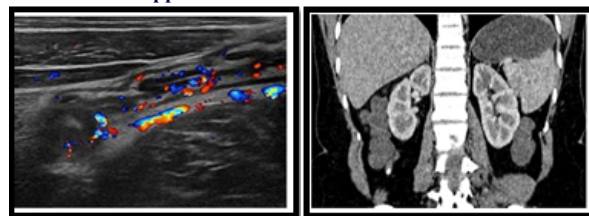


Fig 1a: USG image showing dilated appendix with thickened wall, increased vascularity & appendicolith at the base of appendix

Fig 1b: Sag. & Coronal images of CT showing distended appendix with maximum diameter of 7.7mm, surrounding fat stranding & appendicolith of size 8.6mm.

Case 2 : Ileocaecal Koch's

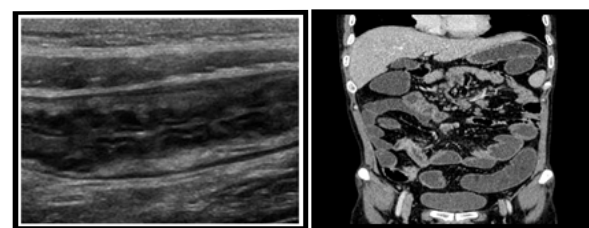


Fig 2a: USG image showing bowel wall thickening of terminal ileum, caecal & ileocaecal junction

Fig 2b: Coronal CT image showing circumferential wall thickening with mild post contrast enhancement causing narrowing of lumen

involving ileocaecal junction, terminal ileum & multiple short segments of ileum and multiple enlarged necrotic lymph node

Case 3 : Ovarian granulosa cell tumour

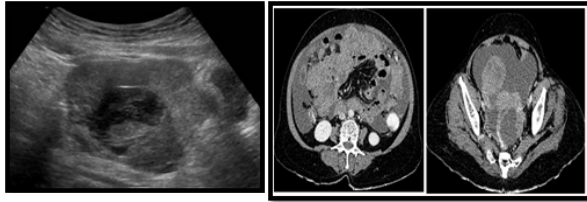


Fig 3a: Heterogenous mixed echoic mass lesion in right adnexa

Fig 3b: Heterogenous mass lesion in right adnexa with gross ascites, peritoneal metastases and omental caking

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