Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2016; 4(6C):2035-2044 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2016.v04i06.034

Original Research Article

Evaluation of RIFmasses: Is Ultrasonography the First Investigation of Choice?

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Abstract: This is a prospective study of sonographic evaluation of 102 patients with right iliac fossa (RIF) masses which includes patients of all age groups and both sexes.In this study the efficiency of ultrasound (US) in diagnosing presence of various RIF masses, the clinicosonographic spectrum of RIF masses, accuracy of US in comparison to clinical assessment in the determination of the organ of origin and pathological nature of RIF mass by Ultrasonography (USG) were evaluated in a systematic manner.The maximum number of cases belonged gastrointestinal pathology (53%) followed by genitourinary pathologies (32%) and 15% cases belonged to non-Gastrointestinal (GI) non-Genitourinary (GU) origin. US is superior to clinical assessment in detecting the organ of origin in RIF masses especially in cases of genitourinary and non-GI non-GU cases. US has high diagnostic accuracy in diagnosing the pathological nature of RIF masses (over all accuracy-92%) while it is 100% accurate in case of appendicular mass, in detecting normal cases, normal variants(clinically diagnosed as RIF masses) , uterine mass, lymphnodal mass and ileocolicintussuception. USG had 100% sensitivity, specificity, positive and negative predictivity and accuracy in detecting presence of mass in the present study. US avoided unnecessary intervention in management in patients with right iliac fossa and is a safe, easily accessible, cost effective and non-invasive imaging modality in providing prudent knowledge of pathology thus, enabling the clinician to make baseline diagnosis. Therefore we propose USG to be the first investigation of choice in evaluation of RIF's masses.
Keywords: Gastrointestinal, genitourinary, appendicular lump, intussuception, ileocaecal tuberculosis, carcinoma caecum, ovarian mass, right psoas abscess**,** lymph nodal mass

INTRODUCTION

Right iliac fossa is such a corner of abdomen which pops up with plethora of pathological conditions which are either confined to this corner or encroach towards it and victimize a large number of patients. A radiologist is primarily challenged to determine the presence of mass, followed by the organ of origin, measure the mass, characterize the mass and determine its effect on organ in vicinity. Though present day diagnostic armamentarium includes CT, MRI, radioisotope and interventinonal studies which has changed the scenario of imaging completely, but US has its unique position. Especially in country like ours US has got its lions share in evaluation of various abdominal masses including the gastrointestinal, genitourinary and masses from various other systems. Its high sensitivity, non-invasive nature, lower cost, general accessibility and no radiation risk has taken it to zenith and enabled it rightly be labelled as initial imaging modality in this regards [1-5]. It not only provides image of mass independent of its and its vicinity organ function but also pioneers as method of choice for guided biopsies and fine needle aspirations. It has been a boon to the pregnant patients by the virtue of lacking radiation risk.

There has been and endless list of conditions presenting as RIF mass but appendicular lump has been found out to be the commonest one in a setting like ours. Other conditions like intussuception, ileocaecal tuberculosis, inflammatory bowel disease, carcinoma caecum, carcinoma colon, suppurated lymphnode or lymphnodal masses etc are seen to afflict this corner of abdomen from children to older patients. 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 neoangiogenisis [3]. It is an adjunct to the gray scale imaging in an endeavour to reach a diagnosis [2].

MATERIAL AND METHODS

This is a prospective study of sonographic evaluation of patients with right iliac fossa masses which includes patients of all age groups and both sexes.A total number of 102 patients referred from various clinical departments with suspected RIF mass were included in the study and evaluated. Approval for the study was obtained by institutional ethical committee.

USG was done onLogic 500 MD MR3 WIPRO GE sonography machine with curvi-linear array transducer with frequency of 2-5 MHz, linear array transducer with frequency of 8.2-11 MHz and endovaginal probe of frequency 5.5-7 MHz in uterine and tuboovarian masses. Prior to performing USG, a verbal informed consent was obtained from patients. Precautions were taken to maintain the privacy of female patients especially during endovaginalsonographic examination. Detailed relevant history taking of patients was followed by thorough general, physical and abdominal examination before subjecting patients to USG examination.

Technique of examination:

Scanning was done in longitudinal and transverse directions covering all the areas of interest. For kidney and retroperitoneum, patients were also scanned in prone and lateral positions. Graded compression technique was utilizedwith exerting gentle compression with the high frequency transducer using both hands in same way when palpating abdomen [1, 2]. This technique not only helped to reduce the focal distance of high frequency transducer, but also displaced gas in bowel producing artifacts and precisely located the region of pathology by maximal tenderness if present. On gray scale sonography following things of masses were evaluated: location, organ of origin, characteristics of mass (size, shape, margin, echotexture, and calcification) and relation to adjacent organs.

This was followed by color Doppler examination with color flow mapping using low flow settings i.e. lowest available repetition frequency, high color Doppler gain possible without background noise signal and restricted color window. On Doppler examination following points were noted: presence or absence of signals, location of signal intralesional and perilesional, enumeration of signals and classify as absent (0), sparse (1-2), moderate (3-4) and abundant (>4). The confirmation of data was done by fine needle aspiration cytology and biopsy, laprotomy, further radiological imaging (CT, barium study, intravenous urography, non-radiological tests, clinical and ultrasonographic follow up.

Statistical Analysis

Z test was used to compare the difference in two proportion and p value was calculated ($p < 0.05$ to be significant). The StataSE10 software program of statistical analysis was used. The information was collected on a predesigned proforma.

RESULTS

In the present study maximum number of cases was found in 31-45 years age group (36.2%) followed by 16-30 years age group (29.4%), 0-15 years age group (13%) and 46-60 years age group (13%). Least number of patients was seen above 60 years of age group (9%). The male to female ratio found to be 1:1.4.The most common presenting symptom was pain in abdomen in 88.2% followed by fever in 32.3%. The distribution of frequency of symptomatology in patients with RIF mass is depicted in Table 1. Though the mass was palpable in all patients it was discovered by patients only in 28.4% cases.

Table 1: Distribution of frequency of symptomatology in patients withRIF mass

Symptom(n=102)*	Number of cases	Percentage (%)
Pain in abdomen	90	88.2%
Fever	33	32.3%
Mass discovered by the patient	29	28.4%
Vomiting	26	25.4%
Gastrointestinal complaints (diarrhea, constipation, blood in stools)	17	17.7%
Menstrual irregularities	12	11.7%
Loss of appetite	10	9.8%
Weight loss	7	6.8%
Abdominal distension	6	5.8%
Bladder complaints (increased or decreased frequency of micturition, burning micturition, hematuria)	3	3.0%

*multiple responses

The maximum number of cases belonged gastrointestinal pathology (53%) followed by genitourinary pathologies (32%) and 15% cases belonged to non-GI non-GU origin. Majority of the

lesions in the present study were found to be infective or inflammatory in origin (49.0%), followed by neoplastic (38.2%) cases, congenital (2.9%) and traumatic (1%). Other lesions (8.8 %) include ileocolicintussuception, incisional hernia, ectopic pregnancy and normal cases.

Out of total of 52 cases of gastrointestinal pathologies, 32 cases were appendicular masses followed by carcinoma caecum accounting to 7 cases (Figure 1-3). Only 1 case each of carcinoma colon and bowel metastasis was found. The one metastatic case was from primary left ovarian adenocarcinoma (Figure 5). Out of the 4 cases of colitis, 3 were diagnosed as infectious and 1 was tubercular in nature (Figure 4). Two cases of infectious colitis showed positive stool culture for E. histolytica and one had positive blood culture for Campylobacter jejuni in a child, while remaining one case of tubercular colitis was finally diagnosed on colonoscopic biopsy and histopathology. There were also 4 cases of ileocolicintussuception (Figure 6). Three cases were of ileocaecal tuberculosis (Figure 7). The Distribution of occurrence of Gastrointestinal pathologies (finally diagnosed) in right iliac fossa is shown in Table 2.

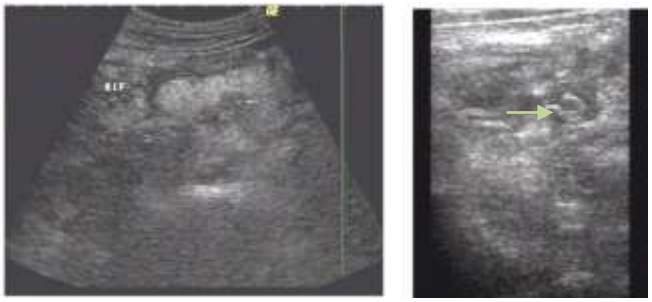

Fig. 1: Appendicular imflammatory mass. US shows ill-defined mass in RIF with central appendix (arrow) and echogenic mesentry surrounding the mass.

Fig. 2: Appendicular abscess. US shows well defined hypoechoic lesion (Asteric) in right iliac fossa overlying the right psoas muscle (black arrow)

Fig. 3: Carcinoma Caecum in RIF. US showing circumferential wall thickening with target appearance of caecum.

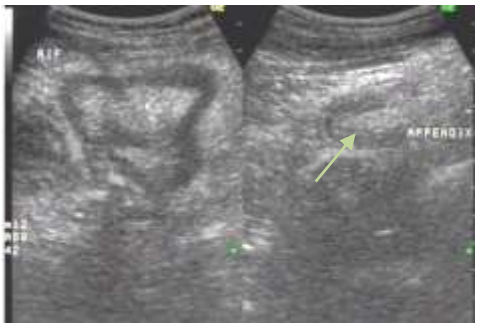

Fig. 4: Colitis. US showing mucosal and mural thickening of ascending colon in a case of infectious colitis suspected clinically as appendicular mass. Arrow showing normal appendix.

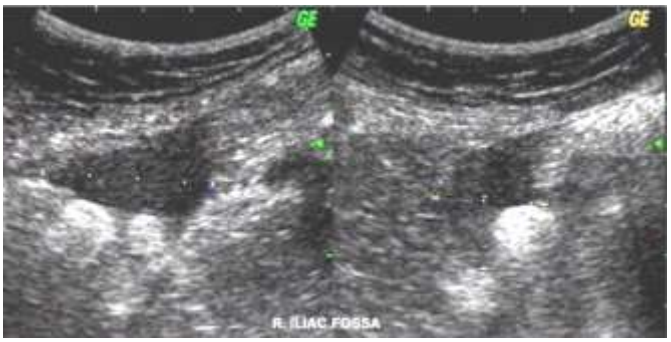

Fig. 5: Bowel metastasis in RIF. Well defined hypoechoic bowel mass in RIF in a case of primary left ovarian adenocarcinoma.

Fig. 6: Ileo colic intussuception. US show target and bowl in bowel appearance of intussuception on axial and longitudinal scans respectively.

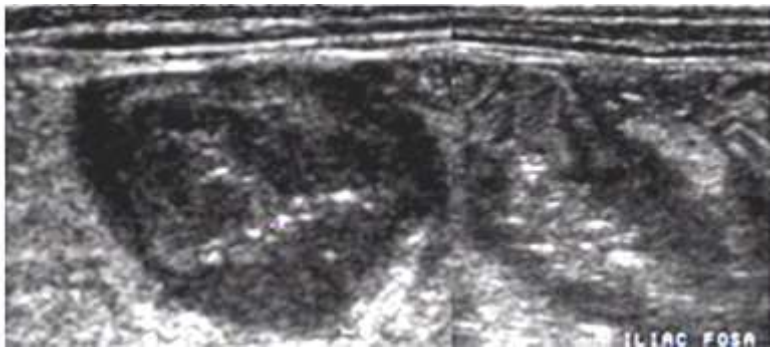

Fig. 7:Ileocaecal tuberculosis. Axial high resolution US showing circumferential thickening of caecum and terminal ileum.

In GU pathologies out of 21 ovarian masses (as shown in table 3) 5 were malignant, 14 benign and 2 were haemorrhagic cyst (Figure 8 - 10). All were right sided GU pathologies except only two which were extending from left side; one malignant ovarian mass and other was a huge left ovarian haemorrhagic cyst. There were 5 uterine leiomyomas extending to right iliac fossa (Figure 11). A single case of right adnexal ectopic pregnancy with loculated hematoma was seen extending in RIF. There were three cases of congential etiology which comprised of 1 left sided caudal crossed fused renal ectopy and 2 right ectopic iliac kidneys (Figure 12).

Fig. 8: Malignant right ovarian mass extending to RIF. Axial US show a mixed echogenic mass with internal septations and solid cystic components extending in right iliac fossa and right lumbar region.

Fig 9: Transvaginal scan of same patient shows the lesion arising from pelvis in right ovary.

Fig 10: Benign ovarian mass. Multicystic benign ovarian cystadenoma extending to right iliac fossa.

Fig.11: Posterolateral uterine fibroid. Longitudinal US showing well defined hypoechoic mass (asterisk) arising from right posterolateral surface of uterus extending to RIF

Fig. 12: Low lying kidney in RIF. US showing malrotated right kidney in RIF

In the non-GI non-GU pathologies lymphnodal masses were maximum which comprised of 26.6% of cases out of 15 nonGI nonGU pathologies followed by right psoas abscess in 13.3%cases (Table 4 and figure 13). In lymphnodal masses, out of 4 cases 3 were metastatic lesions and one was non Hodgkins lymphoma (figure 14). The metastatic lymphnodes showed their primary as melanocarcinoma right foot, post operated right seminoma testis and an occult primary respectively. Other two cases of non-GI non-GU pathologies in neoplastic variety were a single case of retroperitoneal malignant spindle cell neoplastic mass and other was Chondrosarcoma of right innominate bone (Figure 15). CT was done in case of retroperitoneal mass which suggested that mass was a malignant retroperitoneal lesion. In case of chondrosarcoma of right innomiate bone, X ray and CT was done which showed bony mass involving right innomiate bone further proved on FNAC. There were one case each of hydatid cyst and incisional hernia (Figure 16 & 17).

Fig. 13. Right psoas abscess. Longitudinal US shows well defined hypoechoic collection in right psoas muscle.

Fig. 14: Metastatic mass in RIF. US shows mixed echogenic mass with few necrotic areas within

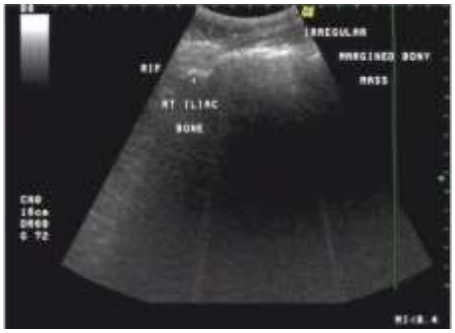

Fig 15:Chondrosarcomaright innominate bone. A bony mass is seen with posterior acoustic shadowing in continuity of right iliac bone obscuring the details of mass

Fig. 16: Hydatid cyst in RIF. US shows well defined double walled multicystic lesion in RIF.

Fig 17: Incisional hernia in RIF. Hyper echoic contents of omentum herniating through a rent (arrows) in the abdominal wall in RIF.

The comparison of efficiency of USG and clinical assessment in correctly detecting the organ of origin in Gastrointestinal, Genitourinary and Non GI-Non GU pathologies in RIF are depicted in Tables 2, 3 and 4 respectively.

Table 2: Comparison of efficiency of USG and clinical assessment in correctly detecting the organ of origin in of gastrointestinal pathologies in RIF

Type of mass	No. of confirmed cases	Percentage (%)	No. of cases detected for organ of origin	
			By USG	By clinical evaluation
Appendicular mass	32	61.5%	32	29
Carcinoma caecum	7	13.4%	6	5
Colitis	4	7.6%	3	3
Ileocolicintussuception	4	7.6%	4	3
Ileocaecal tuberculosis	3	5.7%	2	2
Carcinoma colon	1	2.0%	1	1
Bowel Metastasis	1	2.0%	1	0
Total	**52**	**100%**	**49**	**43**

Table 3: Comparison of efficiency of USG and clinical assessment in correctly detecting the organ of origin in of genitourinary pathologies in RIF

Type of mass	No. of confirmed cases	Percentage %	No of cases detected by organ of origin	
			By USG	By clinical evaluation
Right sided ovarian mass	19	59.3%	17	15
Uterine mass	5	15.6%	5	4
Renal mass	3	9.3%	3	0
Left sided ovarian mass	2	6.2%	1	0
Tuboovarian mass	2	6.2%	2	1
Right sided ectopic pregnancy	1	3.1%	1	1
Total	**32**	**100%**	**29**	**21**

Table 4: Comparison of efficiency of USG and clinical assessment in correctly detecting the organ of origin of non-GI non-GU pathologies in RIF

Type of mass	No. of confirmed cases	Percentage (%)	No of cases detected by organ of origin	
			By USG	By clinical evaluation
			Correct	Correct
Lymphnodal mass	4	26.6%	4	2
Right psoas abscess	2	13.3%	2	1
Intraabdominal abscess	1	6.6%	1	0
Right psoas hematoma	1	6.6%	1	1
Parietal wall abscess	1	6.6%	1	1
Chondrosarcoma of R. innomiate bone	1	6.6%	1	1
Incisional hernia	1	6.6%	1	1
Retroperitoneal mass	1	6.6%	1	0
Intraabdominal hematoma	1	6.6%	1	0
Parietal wall hematoma	1	6.6%	0	1
Hydatid cyst	1	6.6%	1	0
Total	**15**	**100%**	**14**	**8**

The present study shows that all cases were true positive and there were no false positive diagnosis in 99 studied cases which indicates that mass was present in right iliac fossa in all 99 cases (Table 5). 3 cases were normal on USG which were palpated clinically as masses. Out of these 3 negative diagnoses, all were true negatives and there was no false negative diagnosis. Therefore, sensitivity of ultrasound was found to be 100 % in correctly identifying patients with RIF mass, specificity was 3/3 = 100% in excluding the presence of RIF mass, positive predictive value was 99/99 =100%, negative predictive value: 3/3 = 100% and accuracy: 100%. The detection of palpable RIF's masses is depicted in table 5.

Table 5: Detection of palpable right iliac fossa masses by ultrasound

	Mass present	Mass absent	Total
Ultrasound +ve	99	0	99
Ultrasound –ve	0	3	3
Total	**99**	**3**	**102**

DISCUSSION

A palpable RIF mass has always been a mysterious aspect throughout the times. USG has added its usefulness to clinicians to arrive at appropriate diagnosis in adjunct to good history taking, thorough clinical examination coupled with routine investigations.Out of 52 gastrointestinal pathologies, US correctly identified organ of origin in 49 (94.2%) cases in comparison to clinical evaluation which identified in 43 cases (82.6%). However, statistically significant difference in two proportions of correctly identified GI pathologies in present study was not established (z= 1.84 p =0.066). Millard *et al.*;[6]in their study also showed correct diagnosis of US in 77.7% which is less as compared to present study. In our study, maximum errors were in cases of ileocaecal tuberculosis (33.3%) on USG evaluation. While on clinical assessment ileocaecal tuberculosis (33.3%) and carcinoma caecum (28.5%) were the sources of maximum error. There were 61.5% cases of appendicular lump in GI pathologies out of which clinicians detected it correctly in 90.6%, while USG in 100% cases.

Carcinoma colon was also correctly diagnosed on USG (100%). Errors were made in diagnosis of tubercular colitis and ileocaecal tuberculosis on USG which were wrongly diagnosed as carcinoma caecum and in a case of carcinoma caecum which was wrongly diagnosed as ileocaecal tuberculosis. In above cases sonographically showed mural thickening of caecum giving 'target appearance'. The identification of 'target pattern' whilst not specific for any disease but is typical of abnormalities involving the hollow abdominal viscera, stated by Joseph R. Fakhry*et al.*;[7]. HosseinJadvar*et al.*;[8] also reported that in hypertrophic form of intestinal tuberculosis, a mass or multiple nodules with or without caseous necrosis may mimic malignant neoplasm such as lymphoma or carcinoma.

USG also correctly diagnosed ileocolicintussuception (n=4, 100% sensitivity, specificity and negative predictive value respectively). The present study is comparable to study conducted byPaul Verschelden*et al.*;[9]who reported 100%

sensitivity, 88% specificity and 100% negative predictive value in diagnosis of intestinal intussuception by USG. USG also diagnosed a single case of bowel metastasis correctly whose primary was found in left ovary.

Out of 32 cases originating from genitourinary tract US correctly identified organ of origin in 29(90.6%) in comparison to clinical assessment which identified only in 21 (65.6%). This is less in comparison to comparison to study done by Millards*et al.;*[6] which were 100%. Ultrasound was significantly more accurate than clinical evaluation in detecting organ of origin in genitourinary pathologies which also proved statistically significant difference (z= 2.66, p=0.0079). Maximum errors on USG were in left sided ovarian mass extending to RIF (50%). On clinical assessment maximum errors were seen in cases of renal masses (100%) in right iliac fossa followed by tuboovarian mass (50%) extending to RIF.

In one case of right ovarian cystadenoma, the presence of multiple cysts with internal echoes gave the fallacious appearance of multiple daughter cysts and hydatid sand hence wrongly diagnosed as ovarian hydatid cyst which was proved to be ovarian cystadenoma on histopathology. Also, the patient was a follow up case of hepatic hydatid cyst. A single other case was misdiagnosed on USG as torsion of right ovary which had size 7 x 6 cm and was hypoechoic in echotexture which gave it a solid appearance with minimal peripheral vascularity on doppler studies .However the lesion turned out of be a haemorrhagic cyst of ovary on laprotomy and histopathology. The third case was a left ovarian haemorrhagic cyst whose side and site was misdiagnosed as right ovarian complex cyst. USG showed a huge multicystic lesion of size 10 x 10 cm with thin septations in right adenxa, which on laprotomy was found to be arising from left ovary. Majority of ovarian lesions were found to be benign masses. Barker CS and Lind sell DRM [10] also stated that if the mass was very large and particularly if it was from pelvis difficulties were encountered in detecting the organ of origin correctly where the other organs would be obscured by it.

Sonography correctly identified the organ of origin in 100% (5 out 5) uterine masses. But it could not give any significant additional advantage over clinical assessment which also diagnosed correct organ of origin in 80% (4 out of 5).Only a single case of uterine mass was misdiagnosed as appendicular lump on clinical assessment. However USG definitely altered the line of management in correctly diagnosing uterine mass which was clinically misdiagnosed as appendicular lump.

Sonography also diagnosed organ of origin (100%) accurately in 3 renal masses. Out of three renal masses, US detected two as right ectopic malrotated iliac kidney which were misdiagnosed as ileocaecal tuberculosis clinically. They underwent barium meal follow through which was found to be normal. Third case was left caudal crossed fused ectopic kidney in right iliac fossa detected correctly by USG and misdiagnosed as appendicular lump on clinical assessment. A follow up US scan revealed no abnormality of appendix. All the three cases were confirmed on intravenous urography as well. So, USG here not only suggested the correct organ of origin but also avoided the unnecessary intervention by the surgeons. Millard *et al.;*[6]also discovered normal variants as low lying kidney and Riedel's lobe presenting as RIF mass in his study. Das Ssaid that a low lying kidney can present as right iliac fossa mass[11].

US correctly diagnosed the pathological nature 14 cases (93.3%) out of total 15 cases of non-GI non-GU pathologies which is more in comparison to study of Millards*et al.;*[6] which detected correct nature in 77%. On the other hand clinical assessment could detect only 8 (53.3%) patients correctly. The difference is significant statistically (z = 2.064, p=0.0039). US correctly detected pathological nature of lesion in lymphnodal masses, psoas abscess, psoas hematoma, incisional hernia, parietal wall abscess, malignant retroperitoneal mass, intraabdominal abscess and hematoma.

Only a single post operated case of right sided hernioplasty who had hematoma in parietal wall was misdiagnosed to have haemorrhagic collection intraperitoneally. In this case, USG revealed a large anechoic collection of size 12.3x9.4 cm noted intraperitoneally in right lumbar and right iliac fossa region. It may be because of the large size of lesion the exact site of the collection in parietal wall could not be made out. The other two cases of parietal wall abscess and intraabdominal abscess were correctly identified on USG. Barker CS and Lind sell DRM[10] said that in very large masses it is difficult to detect the organ of origin.

Maximum cases of non-GI and non-GU pathologies were lymphnodal mass(4) in RIF. USG was 100% correct in detecting their organ of origin. The supportive evidence of hepatosplenomegaly, retroperitoneal and mesenteric lymphadenopathy, supported USG diagnosis of Non Hodgkins Lymphoma. While in case of Non Hodgkins lymphoma clinical assessment was incorrect as it misdiagnosed as appendicular lump. On FNAC it was confirmed to be NonHodgkins Lymphoma. Mueller *et al* [12] showed that mesenteric lymphomatous involvement characteristically produced a lobulated, confluent,

anechoic mass surrounded by central reflective region due to encasement of mesenteric vessels called Sandwich sign. Sonography is considered as best initial diagnostic procedure for evaluating abdominal masses especially in cases of lymphomas where high sensitivity has been mentioned for abdominal lymph node detection [13].

Next in number was psoas pathology which included two cases of psoas abscess and one warfarin induced psoas hematoma. USG in cases of psoas abscess revealed hypoechoic collection in right psoas muscle and bulky psoas muscle. Yadav RP*et al.;*[14] said that sonography is a quick, safe, and economical and a sensitive imaging modality in evaluation of psoas abscess. Aspiration of pus in case of abscess and haemorrhagic fluid in case of hematoma confirmed the diagnosis. The culture of the pus revealed the growth of staphylococcus.

A single case of malignant retroperitoneal mass in right iliac fossa was correctly diagnosed on USG and was found to be malignant spindle cell neoplasm on histopathology. CT also suggested it to be a retroperitoneal malignant lesion. USG was also correct in identifying bony nature in a case of chondrosarcoma of right innomiate bone (confirmed on FNAC), incisional hernia and RIF's hydatid cyst. In case of RIF's hydatid cyst, findings were further supported by CT which revealed disseminated multiple intraabdominal, pelvic and large hepatic hydatid apart from the RIF's lesion and on laprotomy. Utpal De [15] reported a primary intraabdominalhydatid cyst in the right iliac fossa masquerading as appendicular lump. They suggested that intraperitonealhydatid cysts usually develop secondary to spontaneous or iatrogenic rupture of hepatic, splenic or mesenteric cysts. Primary peritoneal hydatid cyst masquerading as ovarian, mesenteric, duplication and other intra-abdominal cysts have been reported. Hydatid cyst, intraabdominal hematoma, intraabdominal abscess and retroperitoneal masses were misdiagnosed clinically.

Three cases that had no masses in RIF on sonographic examination and were considered normal but clinically masses were palpated. One was clinically suspected of ileocaecal tuberculosis but sonography revealed no lesion. This was further supported by barium meal follow through which was also normal. In two other cases diagnosed as appendicular lump clinically but were normal on USG, follow up ultrasound was done and it also revealed no mass.

Comparing the overall accuracy of USG, the pathological nature of RIF's masses was accurately diagnosed in 92% in the present study. This is more as compared to study done by Millard *et al.;*[6] and Barker CS and Lind sell DRM [10] in whose studies the pathological nature was accurately diagnosed in 82% and 77% respectively. The present study constituted appendicular masses as maximum number of cases and diagnosed correctly, which shows efficiency of ultrasound in diagnosing appendicular masses. The second most common pathology was right ovarian mass extending to RIF. Both Millard *et al.;*[6] and Barker CS and Lind sell DRM [10]in their studiesstated that in any patient with palpable RIF mass, US should be primary investigation.

The initial consideration in evaluation of right iliac fossa mass is whether the lesion is present or not. In present study, sonographically detectable masses were 99 and all of them were finally diagnosed as right iliac fossa masses out of which 3 were normal variant (i.e. low lying kidney). The sensitivity and specificity of ultrasound for detection of right iliac fossa mass was found to be 100% which is similar to studies done by Barker CS and Lind sell DRM[10] and Millard *et al.;*[6] as both showed high sensitivity and specificity of ultrasound for detection of presence of abdominal and RIF masses respectively. So ultrasound seems to be a credible test of exclusion of right iliac fossa masses.

CONCLUSIONS

USG can unravel pathologies which are inaccessible to clinical examination. It lacks hazards of radiation hence entitled to be a safe imaging modality and does not require any sedation or contrast agents [2, 3, 4]. Ultrasound is superior to clinical assessment in detecting the organ of origin in Right iliac fossa masses especially in cases of genitourinary and non-GI non-GU cases. US has high diagnostic accuracy in diagnosing the pathological nature of RIF masses (over all accuracy 92%) while it is 100% accurate in appendicular mass. It is also highly accurate (100%) in detecting normal cases and normal variants (low lying kidney) clinically diagnosed as RIF masses, uterine mass, lymphnodal mass and ileocolicintussuception. USG had 100% sensitivity, specificity, positive predictivity and negative predictivity and accuracy in detecting presence of mass in RIF in present study .Therefore, US avoided the unnecessary intervention (diagnostic or surgical) in management in patients with RIF masses by accurately detecting the presence or absence of mass. But as it is operator dependent, expertise and adequately trained personnel is required for its accurate interpretation. However as far as its efficacy is considered we strongly recommend US as the initial modality of choice for patients with right iliac fossa masses.

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