



USG and CT Evaluation of Adnexal Masses

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Abstract

Aims and Objective: *To determine the ultrasound and computed tomographic characteristics of various adnexal masses. To study about the nature and location of the Adnexal mass and correlate with histological evaluation.*

Materials and Methods: *It was hospital based, observational, descriptive and cross sectional study with a sample of 50 patients during the period of 2years in the Department of Radiodiagnosis, VIMSAR, Burla. The patients were referred from the Department of Obstetrics and Gynaecology, VIMSAR, Burla. The referred cases were having clinical features of abdominal pain, abdominal lump, menstrual irregularity, ascites and anorexia or weight loss and suspected cases of adnexal masses Pregnant patients and those for follow up were excluded. The patients were subjected to ultrasound and CT.*

Results: *Out of total 50 cases, 14 were malignant and 36 were benign.*

Conclusion: *The fact on observation was that most of the adnexal masses were benign. The benign masses were maximum in the age group below 30 years while malignant masses were merely found in women \geq 50 years-most common was malignant ovarian tumor.*

Both USG AND CT were highly sensitive and specific and often complementary in nature. USG accurately diagnosed the adnexal masses while CT is the state of art imaging modality to determine the origin and characterization of its content.

Keywords: *Ovarian Malignancy, Ultrasound, Computed Tomography.*

Introduction

Adnexal masses are quite common and major problem in day to day gynaecological and surgical practice. A reliable method to differentiate benign from malignant adnexal masses would allow for appropriate sub speciality referral, optimal preoperative planning and counselling of the patient. The most common benign adnexal masses were dermoid then simple ovarian cyst and most malignant cases were malignant ovarian tumor. The diagnosed cases subjected for operation by a

specialist gynaecological oncologist were better than those carried by a non-oncological surgeon (Junor et.al 1999). Ultrasound is the accepted primary imaging technique for evaluating adnexal masses as it is safe and non-invasive. The recent development in the biomarkers and USG findings are strongly suspicious of malignancies to assess the extend and staging for operational approach.

Therefore, in the present study we have tried to determine the USG and CT characteristics of

various adnexal masses and to correlate with histological evaluation.

Materials and Methods

The study was hospital based conducted in VIMSAR, Burla, Dist-Sambalpur (Odisha) during the period of September 2011 to September 2013. It was an observational, descriptive and cross sectional study. The sample size was 50 cases with patients referred from the Department of Obstetrics and Gynaecology, VIMSAR, Burla. The referred cases were having clinical features of abdominal pain, abdominal lump, menstrual irregularity, ascites and anorexia or weight loss and suspected cases of adnexal masses. Pregnant patients, patients with hypersensitivity to contrast media and those for follow up were excluded.

The patients were subjected to ultrasound with colour Doppler using Philips HD 7 Colour Doppler machine, Computed Tomography using Siemens Somatom emotion scanner and selected cases were correlated with clinical/histopathological/surgical findings.

Criteria/parameters were assessed by grey scale sonography – size of mass ≤ 4 cm or >4 cm, wall thickness ≤ 3 mm or >3 mm, margin - regular or irregular, septal thickness -absent or thin (≤ 3 mm) or thick (>3 mm), echogenicity – anechoic or low echogenic, tissue content – solid or cystic or mixed, presence of ascites or lymphadenopathy, involvement of pelvic organs or side wall.

Sonographic morphological criteria were taken according to *Ferrari et al (1997)*¹ and *Stevens et al(1991)*². The probes used were 3-5 MHz transabdominal curvilinear USG probe and 6-8 MHz transvaginal USG probe.

CT scan of abdomen and pelvis were done with Siemens Somatom Emotion single slice spiral CT machine and the findings were correlated accordingly. All patients for CT were advised 4hours fasting and written consent were taken prior to NCCT and CECT examination. Non ionic iodinated IV contrast (Ultravist) was used if indicated after evaluation of serum creatinine level. Statistical analysis of sonography and CT

determining nature and characterization of adnexal masses of 50 patients were compared with final diagnosis.

Observation and Discussion

Out of 50 patients, maximum were of age group 20-40years. The age distribution(Table 1) as per nature of adnexal masses-majority were benign lesions within 20-40 years (70%) and malignant lesions above 50years (71.5%). This was similar to study done by Jha et al(2008)

Table -1 : Age distribution as per nature of adnexal masses

Age in Yrs	Benign		Malignant		Total
	No	%	No	%	
<30	18	36	1	2	19
30-39	17	34	2	4	19
40-49	1	2	1	2	2
50-59	0	0	6	12	6
≥ 60	0	0	4	8	4
Total	36	72	14	28	50

Pain abdomen was the most frequent symptom (64%) followed by abdominal distension (32%) and menstrual irregularity (24%)(Table 2). Our study was comparable with that of *Deland(1979)*³ and *Manivasakan J.etal (2012)*⁴.

Table -2 Clinical Presentation of All Cases

Chief Complaints	No of cases	Percentage of cases
Pain abdomen	32	64
Abdominal distension	16	32
Menstrual irregularities	12	24
Total	50	100

Most of the benign lesions were in pre-menopausal (78%). Around 50% malignant ovarian cases were post-menopausal. *Ahmed et al (2013)*⁵ in a study of 50 cases found 88% benign tumors were pre-menopausal and 56% malignant tumors were post-menopausal. There were 12 malignant cases, out of 14 cases showing tumor size > 4 cm. But most benign tumors were of size < 4 cm. *Meyer et al (1995)*⁶ in their study detected tumor size >5 cm and multi-loculations ominous for ovarian malignancy. Most of the malignant lesions were having wall thickness >3 mm. *Benacerraf et al (1990)*⁷ found similar finding in their study. Most of the malignant

tumors were either ecogenic or with solid components and similar to studies by Moyle J W et al (1983)⁸. Out of 14 malignant tumors, 8 were showing septal thickness >3mm supported by Brown et al(1998)⁹ and Stein B et al(1995)¹⁰. Alcazer et al. developed scoring system and morphological index for USG features such as size, wall thickness, solid components and septal thickness.

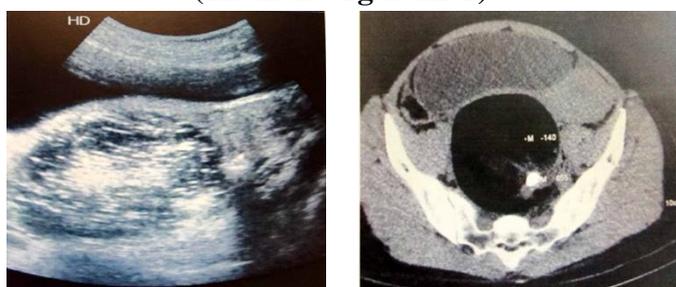
Huber S et al (2002)).CT had a sensitivity of 92.9% and specificity of 94.4% in the diagnosis of adnexal masses in our study. It was found to have a high negative predictive value. This was supported by Buist et al (1994)¹¹, they found MRI has no additional value over CT.



USG and CT showing B/L Adnexal masses (Krukenberg Tumor)



USG and CT showing Mucinous Cystadenocarcinoma



USG and CT showing Dermoid Cyst

Table 4 CT characteristics of benign and malignant masses

CT characteristics		Incidence			Statistics	
		ben	mal	Tot	χ^2	P
Size	<4cm	30	2	32	20.86	<0.001
	>4 cm	6	12	18		
Wall	<3mm	33	1	34	34.02	<0.001
	>3mm	3	9	12		
	NA	0	4	4		
Density	Hypo	16	0	16	9.22	<0.001
	Hyper	5	4	9		
	Mixed	15	10	25		
Fat	Absent	27	13	40	2.01	<0.001
	Present	9	1	10		
Calcification	Absent	27	13	40	2.01	<0.001
	Present	9	1	10		
Ascitis	Absent	31	1	32	27.28	<0.001
	Present	5	13	18		
Lymphadenopathy	Absent	36	4	40	32.14	<0.001
	Present	0	10	10		
Pelvic organ involve	Absent	35	8	43	13.45	<0.001
	Present	1	6	7		
Total		36	14	50		

Table -3 USG characteristics of benign and malignant masses

USG characteristics		Incidence			Statistics	
		ben	mal	Tot	χ^2	P value
Size	<4cm	30	2	32	20.86	<0.001
	>4 cm	6	12	18		
Wall	<3mm	32	1	33	31.45	<0.001
	>3mm	4	9	13		
	NA	0	4	4		
Echogenicity	Anechoic	15	0	15	40.49	<0.001
	Low echo	21	2	23		
	Solid areas	0	12	12		
Septation	Absent	20	0	20	41.18	<0.001
	<3 mm	16	2	18		
	>3mm	0	8	8		
	NA	0	4	4		
Ascitis	Absent	31	2	33	23.17	<0.001
	Present	5	12	17		
Lymphadenopathy	Absent	36	6	42	24.49	<0.001
	Present	0	8	8		
Pelvic organ involve	Absent	35	8	43	13.45	<0.001
	Present	1	6	7		
Total		36	14	50		



USG and CT showing Twisted Ovarian cyst

In our study, CT was more sensitive in detection of lymph node involvement and ascites (supported by



USG and CT showing Hydrosalpinx



USG and CT showing Mucinous Cystadenoma

Summary and Conclusion

Two imaging modalities used were USG and CT to evaluate the origin of adnexal mass, its morphological features and its nature whether malignant or benign.

The benign adnexal masses were maximum in the age group below 30years whereas malignant masses were found in women above 50years. The most common presenting complain was pain abdomen followed by distension and irregular menstruation.

USG features suggestive of malignancy were size > 4cm, wall thickness > 3mm, presence of ascites and lymphadenopathy. CT had maximum accuracy in the diagnosis of a malignant ovarian tumor on the basic criteria of such as size > 4 cm, necrosis in the tumor, septal thickness >3mm and tissue content. Therefore, all the patients in young age group especially with normal CA- 125 should be evaluated by CT to exclude malignancy. False positive cases in USG turned out o be dermoid cyst, mucinous cystadenoma and haemorrhagic cysts.

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