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ROLE OF MULTI-DETECTOR COMPUTED TOMOGRAPHY IN CHARACTERIZATION OF OVARIAN MASSES WITH CYTO-HISTOPATHOLOGICAL CORRELATION

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ABSTRACT

ORIGINAL RESEARCH ARTICLE

Background: Ovarian cancer continues to pose a major challenge to physicians and radiologists. Besides clinical examination, CA 125 levels, and ultrasonography, CT scan is also used as a diagnostic technique for ovarian carcinoma and is superior to US in assessment of the nature of ovarian masses. With the advent of MDCT, it has become possible to acquire several thin slices and image reconstruction in axial, coronal and sagittal planes contributing valuable information towards preoperative surgical and management planning. **Objectives:** To evaluate the diagnostic accuracy of MDCT to differentiate between benign and malignant ovarian masses and to compare the findings with cyto- histopathological results. **Materials and methods:** This study was conducted in the department of Radio diagnosis, Dr. Balasaheb Vikhe Patil rural medical college and Dr. Vitthalrao Vikhe Patil Pravara Rural hospital, Loni BK, 413736 during the period of April 2021 to June 2022.CT imaging findings of 50 patients with ovarian masses were compared with cyto-histopathological results. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and diagnostic accuracy of MDCT were calculated. **Results:** 50 cases were evaluated by Computed Tomography; total 60 lesions were found (10 bilateral / 50 unilateral). Benign ovarian lesions were present in 28 patients whereas malignant ovarian lesions were present in 22 patients based on Computed Tomography. Cyto/histopathological correlation revealed benign lesions in 30 patients and malignant lesions in 20 patients. The sensitivity, specificity, PPV, NPV and diagnostic accuracy of Computed Tomography was found to be 90.0%, 86.6%, 89%, 85% and 90.0%. **Conclusion:** MDCT imaging offers a safe, accurate and noninvasive modality to differentiate between benign and malignant ovarian masses.

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INTRODUCTION

Ovarian cancer continues to pose a major challenge to physicians and radiologists. It is third most common gynecologic malignancy[1,2] and estimated to be the fifth leading cancer cause of death in women[3] after lung, breast, colon, and pancreatic cancer and constitutes 23% of all gynecological malignancies [4].Besides clinical examination, CA 125 levels, and ultrasonography, CT scan is also used as a diagnostic technique for ovarian carcinoma and is superior to US in assessment of the nature of ovarian masses[5] With the advent of MDCT, it has become possible to acquire several thin slices and image reconstruction in axial, coronal and sagittal planes contributing valuable information towards preoperative surgical and management planning[6]. On CT scan, masses can be characterized and features pertaining to benignity and malignancy can be observed[7]. Therefore, the objective of this study was to evaluate the diagnostic accuracy of MDCT to differentiate between benign and malignant ovarian masses and to compare the findings with cyto- histopathological results.

AIMS AND OBJECTIVES:

To evaluate the diagnostic accuracy of MDCT to differentiate between benign and malignant ovarian masses and to compare the findings with cyto- histopathological results.

MATERIALS AND METHODS

This study was conducted in in the department of Radio diagnosis, Dr. Balasaheb Vikhe Patil rural medical college and Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni BK, 413736

Study period – April 2021 to June 2022.

CT imaging findings of 50 patients with ovarian masses were compared with cyto-histopathological results. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and diagnostic accuracy of MDCT were calculated.

INCLUSION CRITERIA

- All patients referred to Radio-diagnosis department for computed tomography of ovarian masses diagnosed clinically or on pelvic sonography.

EXCLUSION CRITERIA:

- Patients with ovarian masses without cyto-histopathology.
- Patients presenting with recurrent or residual ovarian masses.

OBSERVATIONS & RESULTS:

50 cases were evaluated by Computed Tomography; total 60 lesions were found (10 bilateral / 50 unilateral). Benign ovarian lesions were present in 28 patients whereas malignant ovarian lesions were present in 22 patients based on Computed Tomography. Cyto/histopathological correlation revealed benign lesions in 30 patients and malignant lesions in 20 patients. The sensitivity, specificity, PPV, NPV and diagnostic accuracy of Computed Tomography was found to be 90.0%, 86.6%, 89%, 85% and 90.0%.

Table no. 1: Age wise distribution of ovarian lesions

Age (years)	Benign (n=30)	Malignant(n=20)
≤17	3	2
Reproductive years (18-45)	15	3
Perimenopausal (46-55)	8	5
Postmenopausal (>55)	4	10

Table no.2 Distribution of patients on the basis of presenting complaints

Presenting complaints	**No. of patients (n=50)**	**Percentage**
Lower Abdominal Pain	40	80.0
Lump	30	60.0
Abdominal Distention	25	50.0
Infertility	10	20.0
Weight Loss	10	20.0
Asymptomatic	15	30.0

Table no.3: Distribution of patients on the basis of their menstrual history

Menstrual History	**No. of patients (n=50)**	**Percentage**
Premenopausal	27	54.0
Postmenopausal	23	46.0

Table no.4 Imaging features and histopathological findings of ovarian masses

Imaging Features	**Histopathological Findings**		**Total (n=100)**	**p value***
	Benign (n=30)	**Malignant (n=20)**		
Cystic	24	4	28	<0.001
Solid-Cystic	2	10	12	
Solid	4	6	10	

Table no.5: Morphological Characteristics of cystic and solid-cystic lesions

Morphological Characteristics		**No. of patients (n=40)**	**Benign (n=26)**	**Malignant (n=14)**	**P value***
Diameter	< 4 cm	28	24	4	<0.001
	>4 cm	12	2	10	
Locularity	Uni	25	20	5	<0.001
	Multi	15	6	9	
Wall Thickness	< 3cm	25	22	3	<0.001
	> 3cm	15	4	11	
Septations	< 3 cm	38	37	1	<0.001
	> 3cm	6	2	4	

Papillary Projections	Present	8	3	5	<0.001
	Absent	92	81	11	
Solid Component/Mural Nodule	Present	12	3	9	<0.001
	Absent	28	23	5	
Fat	Present	13	10	3	<0.001
	Absent	27	16	11	
Calcification	Present	13	9	4	<0.001
	Absent	**27**	**17**	**10**	

Table no.6: Morphological Characteristics of solid lesions

Morphological Characteristics		**No. of patients (n=10)**	**Benign (n=4)**	**Malignant (n=6)**	**P value***
Diameter	**< 4 cm**	4	3	1	**<0.001**
	>4 cm	6	1	5	
Necrosis	**Present**	6	1	5	**<0.001**
	Absent	4	3	1	
Fat	**Present**	5	3	2	**<0.001**
	Absent	5	1	4	
Calcification	**Present**	6	3	3	**<0.001**
	Absent	4	1	3	
Hemorrhage	**Present**	4	3	1	**<0.001**
	Absent	6	1	5	

Table no.7: Enhancement pattern of ovarian masses

		Benign (n=30)	**Malignant (n=20)**	**P value**
Enhancement	Present	4	18	<0.001*
	Absent	26	2	
Location	Septal/Wall	4	4	0.001*
	Solid component/Papillary Projections	0	14	

Table no.8: Ancillary findings associated with ovarian masses

Findings		**No. of patients (n=50)**	**Benign (n=30)**	**Malignant (n=20)**	**P value***
Pelvic Side wall/ organ invasion	Present	10	1	9	
	Absent	40	29	11	
Ascitis	Present	20	2	18	<0.001
	Absent	30	28	2	
Peritoneal Metastasis	Present	10	0	10	<0.001
	Absent	40	30	10	
Lymphadenopathy	Present	18	4	14	<0.001
	Absent	**32**	**26**	**6**	

DISCUSSION:

CT features that were considered suggestive of benignity were the following: a lesion diameter of less than 4 cm, entirely cystic components, lack of internal structures, a wall thickness of less than 3 mm and absence of ascites or invasive disease such as peritoneal metastases or lymphadenopathy.

Conversely, CT primary features indicative of malignancy were the following: size larger than 4 cm, presence of bilateral adnexal masses, a mass partly cystic and solid, with solid components enhancing after contrast material administration and presence of necrosis in a solid tumor.

Ancillary findings such as, pelvic organ or pelvic sidewall invasion, ascites, peritoneal metastases and lymphadenopathy were used to confirm malignancy. The most commonly employed imaging modality for pelvic pathologies and adnexal masses is ultrasonography. Although it is the standard method for the preliminary assessment, due to its low cost, easy availability and high sensitivity of approximately 85-100%, it is still lagging behind CT and MRI due to its variable specificity rate (50-100%). The values of sensitivity and specificity of our study in differentiation of ovarian masses were comparable to those reported in literature. Excellent agreement was found between the reported findings and the histopathological results. Also, in our study all patients underwent cyto-histopathology (Gold-standard), thus minimizing verification bias and reporting accurate sensitivity rate.

CONCLUSION:

MDCT imaging offers a safe, accurate and noninvasive modality to differentiate between benign and malignant ovarian masses.

CONFLICT OF INTEREST: None

REFERENCES:

1. Silverberg E, Boring CC, Squires TS (1990). Cancer statistics. *Cancer*, 40, 9-26.
2. Tanwani AK (2005). Prevalence and pattern of ovarian lesions. *Ann Pak Inst Med Sci*, 1, 211-4.
3. Landis SH, Murray T, Bolden S, Wingo PA (1998). Cancer statistics. *Cancer*, 47, 6-29.
4. Woodward PJ, Hosseinzadeh K, Saenger JS (2004). Radiologic staging of ovarian carcinoma with pathologic correlation. *Radiographics*, 24, 225-46.
5. Yasir Jamil, Saima Hafeez, Tariq Alam, Madiha Beg, Mohamma Awais, Imrana Masroor (2013) et al Ovarian masses: is multi-detector computed tomography a reliable imaging modality?

6. Parrish FJ (2007). Volume CT: state-of-the-art-reporting. *Am J Roentgenol*, 189, 528-34.
7. International Journal of Women's Health 2011:3 123–126 role of multidetector computed tomography (MDCT) in patients with ovarian masses.
8. Kinkel K, Lu Y, Mehdizade A, Pelte MF, Hricak H. Indeterminate ovarian mass at ultrasound: incremental value of second imaging test for characterization-meta analysis and Bayesian analysis. *Radiology*. 2005; 236:85–94.
9. Tsili AC, Tsampoulas C, Charisiadi A, et al. Adnexal masses: accuracy of detection and differentiation with multidetector computed tomography. *Gynecol Oncol*. 2008; 110:22–31.
10. LiuY. Benign ovarian and endometrial uptake on FDGPET-CT: patterns and pitfalls. *Ann Nucl Med*. 2009; 23:107–112.