

Clinical Correlation of Ovarian Cyst Malignant or Benign with Ultrasound Reports

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ABSTRACT

Objective: To investigate clinical correlation of ovarian cyst malignant or benign with ultrasound reports.

Study Design: Prospective observational study

Place and Duration of Study: Department of Radiology, Ghulam Muhammad Mahar Medical College, Sukkur from 1st November 2019 to 31st July 2021

Methodology: Ninety five patients with accidental diagnosis of ovarian mass were enrolled as patients and had symptoms of abdominal pain, palpable-mass as well as irregularities in the menstrual cycles. Diagnosis of each patient was based on ultrasound which was assisted with TVS or Doppler depending upon the cases under consideration. The ultrasonographical reports were correlated with the clinical examination and diagnosis findings for better assessment of the ovarian mass.

Results: Mean age was 42 years with 62.3% those women who were in reproductive age while rest were having menopause. 70% were presenting abdominal pain and 2% were asymptomatic. Doppler scan reports showed that all cases of malignancy were having high vascularity with $R1 < 0.4$ in 100% of cases while $R1 > 0.4$ was highest in benign cases. The ultrasonographical imaging showed an obvious variance in the imaging reports of benign versus malignant cases where an irregular margin mass was prominently noticeable in cases of malignant ovarian tumor.

Conclusion: High sensitivity and specificity was also seen among clinical cases correlated with ultrasound having Doppler scanning.

Keywords: Ultrasonography, Ovarian cyst, Tumors, Adnexal masses

INTRODUCTION

Ovarian tumors are represented in majority of adnexal mass cases in gynecology.¹ Ovarian tumors have a history of late diagnosis due to their non-visibility unless they attain a specific size. That ovarian mass which is smaller in size and is not able to be diagnosed timely possesses diagnostic challenges.² Their identification is associated with pelvic examination through ultrasonography.³ Pelvic pain or pressure on the pelvis is often related with the adnexal masses. The adnexal masses can be formed in the ovary, fallopian tube or the surrounding regions.⁴ Pelvic ultrasound is considered as the primary diagnostic technique for the identification of adnexal masses. A sonographer required various techniques and correlates them with the clinical symptoms to define an adnexal mass or its differentiation from a physiological normal morphology.⁵

Ultrasound can therefore classify ovary tumors into benign as well as malignant classifications through applying transvaginal sonography (TVS). In patients with unmarried cases transabdominal ultrasound is preferred. Ultrasound using Doppler scanning has also been used for acquiring accuracy in imaging and classification of ovarian tumors.⁶

There are indeed limitations in finding adnexal masses but correlation if ultrasound reporting with clinical diagnosis can assist in better identification of ovarian cysts. Benign ovarian cysts are more likely to be unilateral, free and mobile, cystic in appearance and have well defined margins which are without ascites.⁷ On the other hand, malignant ovarian masses were found to be bilateral with a firm/hard consistency, having ill-defined margins and with ascites.^{8,9} The current research was designed for assessing the ultrasound features of ovarian cysts either benign or malignant for better understanding of the variance and efficient diagnostics of ovarian cysts.

MATERIALS AND METHODS

This prospective observational study was conducted at Department of Radiology, Ghulam Muhammad Mahar Medical College, Sukkur from 1st November 20219 to 31st July 2021. A total number of 95 patients were selected after analyzing their number through sample size calculator using WHO sample size site. A

confidence of interval of 95% and margin of error ad 5% was considered for sample size calculation. The age group distribution presented patients within an age of 13-74 years. Patients with accidental diagnosis of ovarian mass were enrolled as patients and had symptoms of abdominal pain, palpable-mass as well as irregularities in the menstrual cycles. Diagnosis of each patient was based on ultrasound which was assisted with TVS or Doppler depending upon the cases under consideration. The ultrasonographical reports were correlated with the clinical examination and diagnosis findings for better assessment of the ovarian mass. Demographic as well as clinical diagnosis findings were documented in a well-organized proforma. Mass prediction was done through specified criteria which included its appetite. Malignant was considered if it had ill defined margins with ascites, mural-nodule, mixed-echogenicity, thick septa, solid components in it or and multicoated. Doppler scan presented higher vascularity in cases of malignant masses. Data was analyzed through using SPSS version 25.0. Chi square was used for analysis with a p value < 0.05 as significant.

RESULTS

The mean age was 42 years with 62.3% those women who were in reproductive age while rest were having menopause. 70% were presenting abdominal pain and 2% were asymptomatic. The most common symptoms included vaginal bleeding which was not continuous added with abdominal pain. The ultrasound features showed that out of total 95 cases 60 cases were having benign presentation and 35 were having malignant presentation. Cystic appearance was noticed in 56 benign tumors while only in 2 malignant tumors where as solid cysts were associated with malignant tumors only (Table 1).

Doppler scan reports showed that all cases of malignancy were having high vascularity with $R1 < 0.4$ in 100% of cases while $R1 > 0.4$ was highest in benign cases (Table 2). The screening features further presented highest positive predictive value in clinical cases correlated with ultrasound having Doppler scanning. Similarly, highest specificity and sensitivity were also seen among clinical cases correlated with ultrasound having Doppler scanning (Table 3).

The ultrasonographical imaging showed an obvious variance in the imaging reports of benign versus malignant cases where an irregular margin mass was prominently noticeable in cases of malignant ovarian tumor (Fig. 1).

Table 1: Comparison of malignant and benign tumor USG features (n=95)

USG features	Benign (n=60)	Malignant (n=35)	P value
Cystic	56	2	0.001
Solid cystic	-	30	-
Solid	3	35	0.001
Papillary projections	55	0	-

Table 2: Comparison of malignant and benign tumor Doppler scan features (n=95)

Doppler scan features	Benign (n=60)	Malignant (n=35)	P value
Vascularity	6	35	0.002
R1 <0.4	3	35	0.001
R1 > 0.4	57	0	-
P1 <1.0	2	35	0.001
P1 >1.0	58	0	-

Table 3: Evaluation of clinical features within various diagnostic approaches

Screening Features	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Positive Likelihood Ratio	Negative Likelihood	Disease Prevalence
Clinical	87.2%	74.1%	35.8%	97.3%	3.4%	0.17%	14.16%
USG	88.1%	80.6%	56.5%	96%	4.6%	0.15%	22.21%
Doppler	91.4%	91%	82.1%	96%	10.3%	0.09%	30.98%
Clinical +USG with Doppler	92.2%	95.9%	92.4%	96%	22.8%	0.08%	35.4%



Fig. 1: Comparison of a simple ovarian cyst (A) with malignant cyst (B)

DISCUSSION

Ovarian cancer is common in gynaecological cases and it is more frequently observed in higher ages women than to the unmarried girl. It often times leads to worst prognosis due to non-visibility of the cyst unless it attains a certain size.¹⁰ Various imaging modalities applied to find the nature and composition of ovarian mass. Available method rigorously used for pre-operative prediction of ovarian mass nature whether benign or malignant for proper disease management. Present study was designed for the investigation of clinical correlation of ovarian cyst malignant or benign with ultrasound reports.

In this study, ultrasound features showed that 60 cases were having benign presentation and 35 were having malignant presentation. These findings are comparable with other studies as well.^{11,12} Incidence was observed higher in menopausal aged women as compare to the other females. This finding is also somewhat similar to already present data.¹¹⁻¹⁴ Out of the total cases reported 70% were presenting abdominal pain and 2% were asymptomatic. The most common symptoms included vaginal bleeding which was not continuous added with abdominal pain. Different symptoms were present in different studies and asymptomatic individuals were also reported.¹⁰⁻¹³ Highest specificity and sensitivity were also seen among clinical cases correlated with ultrasound having Doppler scanning in present study which is also similar to present data.^{14,15} Doppler scan reports showed that all cases of malignancy were having high vascularity with R1 < 0.4 in 100% of cases while R1 > 0.4 was highest in benign cases. It is also similar to reported literature.

Ultrasonography is a useful tool for ovarian cancer prediction and for distinguishing benign and malignant tumors. Thus present study highlights that, along with USG Doppler scan is highly

recommended for the differentiation of benign and malignant tumors

CONCLUSION

The most common symptom observed in present study is abdominal pain which was present in 97% of the case. High sensitivity and specificity was also seen among clinical cases correlated with ultrasound having Doppler scanning. Nonetheless, exceptionally good results were obtained when USG combined with Doppler scan.

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