International Medicine
www.theinternationalmedicine.org

Research Article

Section: Radiodiagnosis

USG Evaluation of Ovarian Neoplasm with O-RADS Scoring System and Histopathological Correlation

Dr. Gokul Ashok[*1] & Dr. Devdas Acharya[2]

[1]Resident Department of Radiodiagnosis, Yenepoya Deemed to be University

[2]Professor & Head of the Department of Radiodiagnosis, Yenepoya Deemed to be University

ARTICLE INFO

Article History:

Received: 28-12-2024

Accepted: 01-01-2025

Key words:

Ovarian-Adnexal Imaging Reporting and Data System (O-RADS)

Magnetic Resonance Imaging (MRI)

BI-RADS System

Endometriotic Cyst

Dermoid Cyst

***Corresponding author:**

Dr. Gokul Ashok, Resident Department of Radiodiagnosis, Yenepoya Deemed to be University

ABSTRACT

Introduction: Ovarian neoplasms are challenging to diagnose due to their diverse types and clinical behaviors. The Ovarian-Adnexal Imaging Reporting and Data System (O-RADS) standardizes the evaluation of ovarian masses using ultrasound, helping to categorize lesions and guide clinical decision-making for better management. **Aim:** This study aims to evaluate the sensitivity and specificity of the O-RADS scoring system in identifying ovarian neoplasms and to correlate these scores with histopathological results. **Materials and Methods:** This prospective study was conducted at Yenepoya Medical College Hospital, Mangalore, involving 58 female patients with lower abdominal pain and menstrual irregularities. Ultrasound exams were performed using a SAMSUNG HS70A device, and ovarian lesions were classified using the O-RADS scoring system. Patients with O-RADS scores of 2 or higher underwent staging laparotomy, and their histopathological results were compared with the O-RADS scores. **Results:** The mean age of the patients was 45.18 years (SD ± 12.10), with ages ranging from 21 to 66 years. Abdominal pain was the most common symptom (44.8%). O-RADS scores were distributed as follows: O-RADS II (3.4%), O-RADS III (44.8%), O-RADS IV (39.7%), and O-RADS V (12.1%). Histopathological findings included endometriotic cysts (19%), benign serous cystadenomas (13.8%), and high-grade serous carcinoma (8.6%). The O-RADS scoring system demonstrated a sensitivity of 93.55% and specificity of 92.59%, with a strong positive correlation (Spearman's rho = 0.861, p = 0.0001) between O-RADS scores and histopathological results. **Conclusion:** The O-RADS scoring system shows high sensitivity and specificity in assessing ovarian neoplasms' malignancy risk, with a strong correlation to histopathological findings. This supports its clinical value for early detection and improved management, aligning with existing literature on its reliability and accuracy.

INTRODUCTION

Ovarian neoplasms represent a significant challenge in both oncology and gynecology, encompassing a diverse range of tumors that can be either benign or malignant. These tumors arise from the ovaries and can exhibit a wide variety of clinical behaviors, ranging from asymptomatic benign cysts to aggressive, life-threatening carcinomas. The diverse nature of ovarian neoplasms necessitates prompt, precise, and reliable diagnostic methods to ensure timely and appropriate treatment for patients. In this context, the use of a combination of modern imaging technologies and pathological analysis is crucial for accurate diagnosis and effective management.

An emerging tool for assessing ovarian masses is the Ovarian-Adnexal Imaging Reporting and Data System (O-RADS), a standardized imaging-based scoring system designed to categorize ovarian masses based on their likelihood of malignancy. O-RADS primarily utilizes ultrasound and magnetic resonance imaging (MRI) to assess ovarian masses and assign them a score that reflects the risk of cancer. While the O-RADS scoring system provides a valuable framework for the radiological evaluation of ovarian neoplasms, histological analysis remains the gold standard for confirming diagnoses and determining the biological characteri-stics of these tumors.[1]

Histopathological examination, which involves the study of tissue samples from biopsies or surgical excisions, allows for a comprehensive understanding of the cellular and molecular features of ovarian neoplasms. This analysis is essential not only for confirming the diagnosis but also for evaluating the tumor's grade, stage, and

potential for invasion. The ability to distinguish between benign, borderline, and malignant ovarian tumors has direct implications for patient management and treatment planning. Given the importance of both imaging and histopathology in diagnosing ovarian neoplasms, a critical area of investigation is the relationship between O-RADS scoring and histological findings.

Ovarian neoplasms are highly heterogeneous, presenting a broad spectrum of histological subtypes, from benign cysts such as dermoid cysts and endometriomas to aggressive carcinomas like high-grade serous carcinoma. This wide range of possible diagnoses makes accurate evaluation and classification crucial for ensuring appropriate patient care. In particular, early detection of malignant tumors is essential for improving patient prognosis, as ovarian cancer is often diagnosed at an advanced stage, when treatment options are limited.

To facilitate the assessment of ovarian masses, the O-RADS scoring system was developed as a standardized tool for radiologists to evaluate the risk of malignancy based on imaging findings. O-RADS categorizes ovarian masses into five groups (O-RADS I to O-RADS V), with each category representing a different level of risk for malignancy. O-RADS I represents a very low risk of malignancy, while O-RADS V corresponds to a very high likelihood of malignancy. The system has gained traction due to its ability to simplify the communication of imaging results and guide clinical decision-making.

O-RADS, inspired by the BI-RADS system used for breast imaging, provides a common language for radiologists, gynecologists, and oncologists, enabling better commun-ication and facilitating clinical decisions. By classifying lesions into risk categories, O-RADS helps clinicians prior-itize further diagnostic testing and determine appropriate management strategies. Despite its utility, the predictive power of O-RADS for ovarian neoplasms is still an area of active research. While the system effectively stratifies ovarian masses by risk of malignancy based on imaging findings, questions remain about its accuracy in predicting the histological characteristics of these tumors.[2]

Histopathological diagnosis remains the cornerstone of ovarian neoplasm evaluation. Tissue samples obtained through biopsy or surgical excision are analyzed to determine the tumor's cellular morphology, architecture, and molecular characteristics. Pathologists examine these samples to identify key features such as the tumor's grade (how abnormal the cells look under the microscope), stage (the extent of the disease), and whether the tumor is benign, borderline, or malignant.

Histopathological analysis is crucial for several reasons. First, it allows for the differentiation between benign lesions, which may require only observation or minor intervention, and malignant tumors, which necessitate aggressive treatment. Second, histopathology helps in assessing the tumor's invasiveness, which is vital for staging the cancer and determining its potential to spread. The molecular characteristics of the tumor, such as the presence of specific genetic mutations or biomarkers, can also inform prognosis and treatment options.

Moreover, histopathology plays a key role in distinguishing between ovarian tumors that may appear similar on imaging but have different biological behaviors. For example, a cystic lesion with septations on ultrasound may be a benign mucinous cystadenoma or a malignant mucinous carcinoma, and only histopathology can definitively identify the tumor type. This underscores the importance of integrating imaging and histological findings for a comprehensive assessment of ovarian neoplasms.

The accuracy of the O-RADS scoring system in predicting the histological nature of ovarian neoplasms is a critical aspect of its clinical utility. A strong correlation between O-RADS scores and histopathological findings would enhance the system's ability to guide clinical decision-making, reduce unnecessary procedures, and improve patient outcomes.[3]

Histological confirmation remains essential for determining the biological characteristics of ovarian masses. The ability to correlate O-RADS risk scores with specific histological subtypes, such as benign, borderline, or malignant tumors, would allow clinicians to better understand the prognostic implications of imaging findings. A high correlation between O-RADS scores and histological diagnoses could potentially reduce the need for invasive procedures, such as biopsies or staging surgeries, in cases where imaging strongly suggests a benign lesion. Conversely, in cases where imaging suggests a high likelihood of malignancy (O-RADS IV or V), histological confirmation can provide critical information about the tumor's aggressiveness and guide treatment decisions.

This thesis aims to explore the relationship between O-RADS scores and histopathological diagnoses in ovarian neoplasms. By analyzing a cohort of patients who underwent both imaging evaluation and subsequent histopathological examination, this study seeks to clarify the degree to which O-RADS accurately reflects the true pathological features of ovarian masses. The findings from this research could contribute to the ongoing refinement of the O-RADS scoring system and help establish its role in clinical practice as a reliable tool for predicting the biological behavior of ovarian neoplasms.[4]

MATERIAL AND METHODS

This prospective cross-sectional study was conducted at Yenepoya Medical College Hospital, Mangalore, with ethical approval granted. A total of 58 patients with ovarian neoplasms were included. Participants underwent transabdominal and, when applicable, transvaginal sonography using a SAMSUNG HS70A device. Lesions were classified using the O-RADS scoring system, and histopathological findings from staging laparotomy were compared with the O-

RADS scores.. Inclusion criteria required patients to be over 18 years of age with ovarian neoplasms, while exclusion criteria involved patients unwilling to undergo surgery or follow-up.

RESULT

The study included 58 patients, with the majority in the 46-55 years age group (31.0%) and a mean age of 45.18 years. Abdominal pain was the most common chief complaint (44.8%), followed by oligomenorrhea (13.8%) and irregular menstrual cycles (10.3%). Most cysts were unilocular (67.2%), with 58.6% larger than 10 cm. Additionally, 44.8% of cysts contained solid components, indicating a higher risk for malignancy. These results provide valuable insights into the clinical presentation and characteristics of ovarian neoplasms in this patient population.

The distribution of septations in the ovarian cysts showed that 39.7% of the cysts had no septations, while 24.1% had smooth septations, 20.7% had regular septations, and 15.5% had irregular septations. This highlights the variability in the appearance of septations, with irregular septations typically being associated with a higher risk of malignancy. (Table 1)

Table 1: Distribution of Presence and type of Septations within the Cysts.

Septations	F	Percentage (100%)
Regular	12	20.7%
Smooth	14	24.1%
Irregular	9	15.5%
Nil	23	39.7%
Total	58	100%

The distribution of O-RADS scores in the study revealed that the majority of ovarian cysts were categorized as O-RADS III (44.8%), indicating an intermediate risk of malignancy. This was followed by O-RADS IV (39.7%), suggesting a high risk, and O-RADS V (12.1%), which represents a very highrisk. Only 3.4% of cases were classified as O-RADS II, indicating a low risk of malignancy. These results demonstrate the utility of the O-RADS system in risk stratification and guiding clinical management of ovarian masses. (Figure 1)

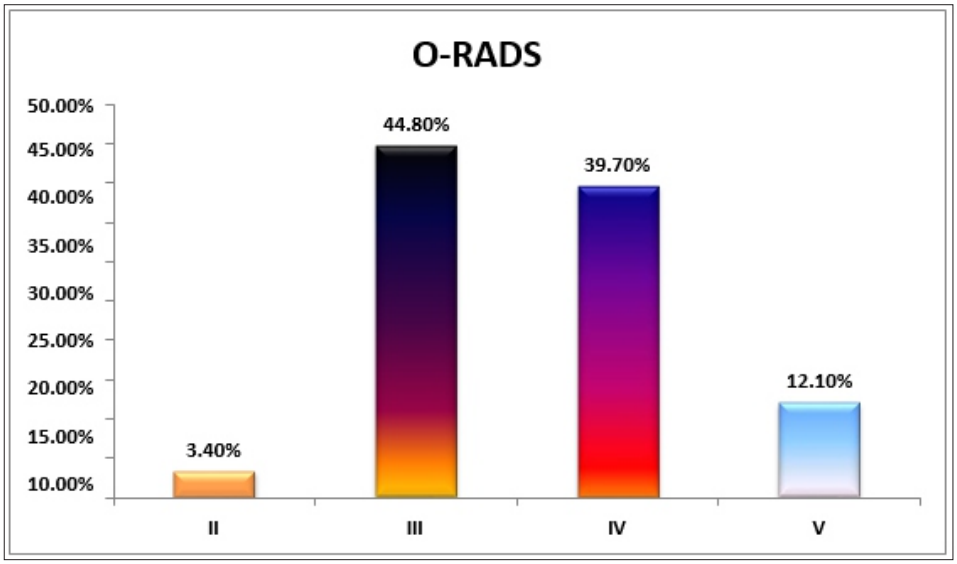

Figure 1: Distribution of O-RADS Scores Among the Patients

The histopathological findings in the study revealed a diverse range of ovarian neoplasms. The most common diagnosis was endometriotic cysts, accounting for 19.0% of cases, followed by benign serous cystadenomas (13.8%) and high-grade serous carcinoma (8.6%). Other malignancies included high-grade ovarian carcinoma (6.9%) and adenocarcinoma (3.4%). Borderline tumors, such as the mucinous borderline tumor and serous borderline tumor, were less frequent, each representing 1.7% of cases. The presence of both benign and malignant pathologies highlights the complexity of ovarian masses and the importance of accurate diagnosis for proper management. (Table 2)

Table 2: Analysis of Histopathological Diagnoses of the Cysts

	Frequency	Percent	Valid Percent	Cumulative Percent
Adenocarcinoma	2	3.4	3.4	3.4
Benign serous ystadenoma	8	13.8	13.8	17.2
Borderline mucinous tumor	1	1.7	1.7	19.0
Carcinosarcoma	4	6.9	6.9	31.0
Clear cell carcinoma	2	3.4	3.4	77.6
Dermoid cyst	2	3.4	3.4	36.2
Endometriotic cyst High	11	19.0	19.0	55.2
Grade ovarian carcinoma	4	6.9	6.9	65.5
High grade serous carcinoma	5	8.6	8.6	74.1
Mature cystic teratoma	2	3.4	3.4	77.6
Mucinous borderline tumor	1	1.7	1.7	79.3
Mucinous cyst adenocarcinoma	2	3.4	3.4	82.8
Hemorrhagic cyst	1	1.7	1.7	84.5
Serous borderline tumor	1	1.7	1.7	86.2
Serous carcinoma-high grade	1	1.7	1.7	87.9
Serous cyst adenocarcinoma	2	3.4	3.4	91.4
Serous papillary carcinoma	5	8.6	8.6	100.0
Total	58	100.0	100.0	

The histopathological analysis of ovarian neoplasms revealed varying scores across different types. Endometriomas had a mean score of 1.33, while multilocular cysts with solid components had a higher mean of 3.67. Ovarian cancer showed the highest mean score of 6.00, followed by ovarian follicles at 4.33. Simple cysts had a mean score similar to endometriomas at 1.33. These findings reflect the diverse nature of ovarian lesions, with ovarian cancer presenting the most complex characteristics. This analysis highlights the variability in USG findings and their relationship to histopathological diagnoses, emphasizing the challenges in correlating ultrasound results with actual ovarian pathology. (Figure 2)

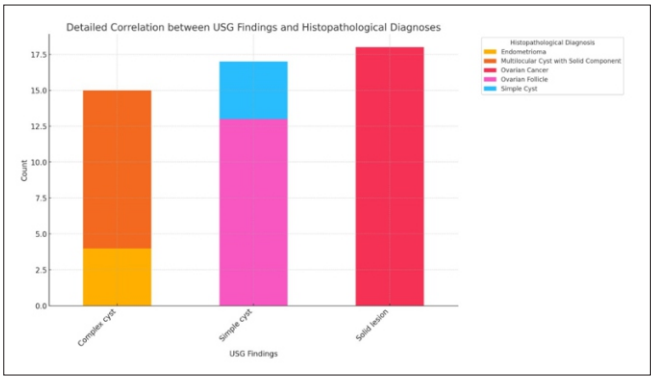

Figure 2: Correlation between USG and Histopathology

The ROC (Receiver Operating Characteristic) curve is used to evaluate the performance of the USG/O-RADS scoring system in predicting ovarian cancer based on histopathological diagnoses. The Area Under the Curve (AUC) measures the model's ability to discriminate between cancer . and non-cancer. An AUC closer to 1 indicates better performance, with the ideal test showing high sensitivity and low false positive rate. The ROC curve helps assess the diagnostic accuracy of the USG/O-RADS system for predicting ovarian cancer

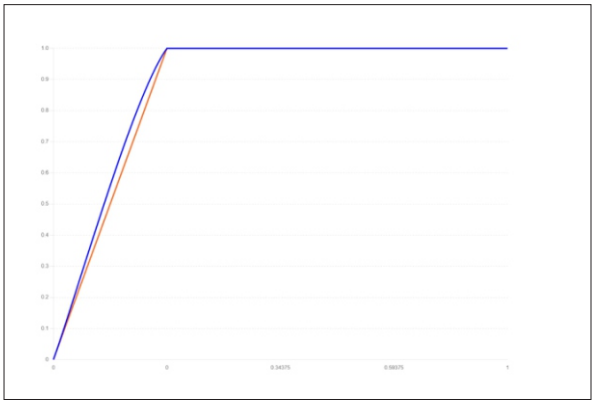

Figure 3: ROC Curve of performance of the USG/ORADS Scoring Systemin Predicting Ovarian Cancer based on Histopathological Diagnoses.

The study shows the association between radiol-ogical diagnoses and histopathological diagnoses was analyzed, showing the number of cases identified as malignant or benign by each method. Out of 58 total cases, 31 were histopath-ologically confirmed as malignant, with 29 of these correctly identified by radiology, resulting in a sensitivity of 93.55% and a specificity of 92.59%. Both the positive predictive value (PPV) and negative predictive value (NPV) were high, further supporting the reliability of radiological diagnosis. Fisher's Exact Test yielded a p-value of 0.0001, confirming a statistically significant association between radiological and histopathological diagnoses.

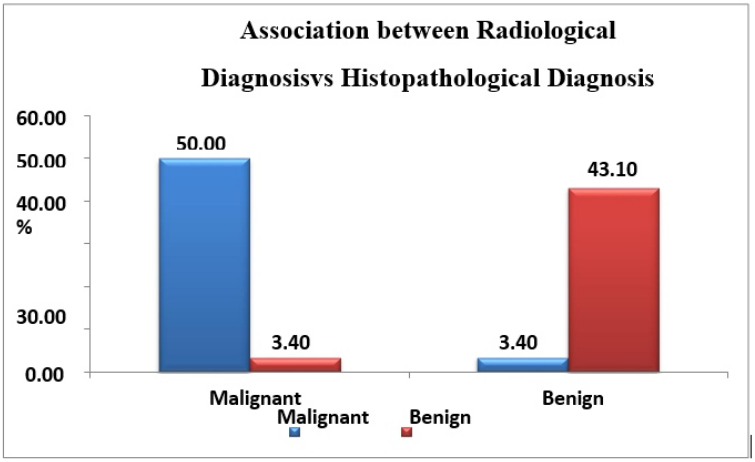

Figure 4: Association between Radiological vs Histopathological Diagnosis

The radiological diagnosis demonstrated high diagnostic performance in predicting ovarian cancer based on histop-athological outcomes, with a sensitivity of 93.55%, spec-ificity of 92.59%, positive predictive value (PPV) of 93.55%, negative predictive value (NPV) of 92.59%, and an accuracy of 72.10%. The prevalence of malignant cases was 53.45% Furthermore, Spearman's correlation analysis revealed a strong positive correlation between radiological and histo-pathological diagnoses, with a correlation coefficient of 0.861 (p = 0.0001), indicating a statistically significant association between the two methods.(Table 3)

Table 3: Spearman's Correlation Analysis for Radiological Diagnosis vs Histopathological

Sensitivity	93.5483871
Specificity	92.59259259
Positive Predictive Value	93.5483871
Negative Predictive Value	92.59259259
Accuracy	72.10344828
Prevalance	53.44827586

			Radiological diagnosis	Histopathological diagnosis
Spearman'srho	Radiological diagnosis	Correlation Coefficient	1.000	.861**
		Sig. (2-tailed)	.	.0001
		N	58	58
	Histopathological Diagnosis	Correlation Coefficient	.861**	1.000
		Sig. (2- tailed)	.0001	.
		N	58	58

Figures 5 to 9: Depict Various Ovarian Cystic Lesions with Distinct Radiological Features on Ultrasound Images, which are then Confirmed through Corresponding Gross Specimens

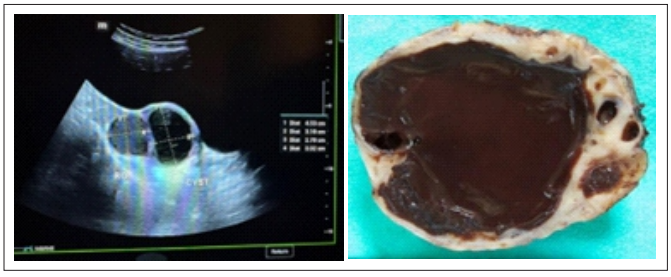

Figure 5: Shows a Ultrasound Image (A) with a well-defined Cystic Lesion in the right Ovary with low-Level Internal Echoes, Suggestive of an Endometriotic Cyst, which was Confirmed upon Gross Examination (B) Showing a Thickened, dark brown outer Surface with Chocolate-Colored Fluid and an Irregular Cyst wall Typical of Endometriosis

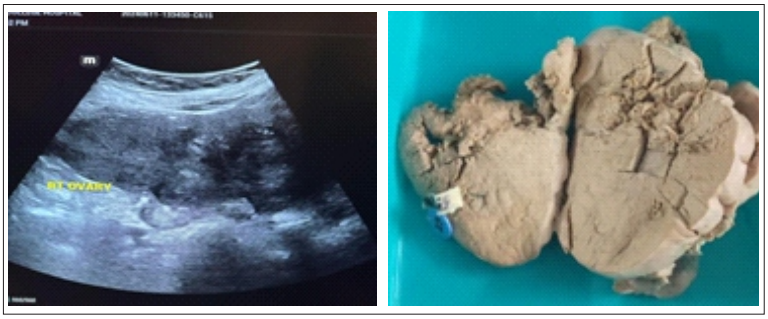

Figure 6: Shows a Ultrasound Image (A) with a Large Solid Cystic Lesion is Observed in the right Adnexa, with the right Ovary not Separately Visualized, Suggestive of a Malignant Ovarian Neoplasm, as Confirmed by the Gross Specimen (B) of the Malignant Ovarian

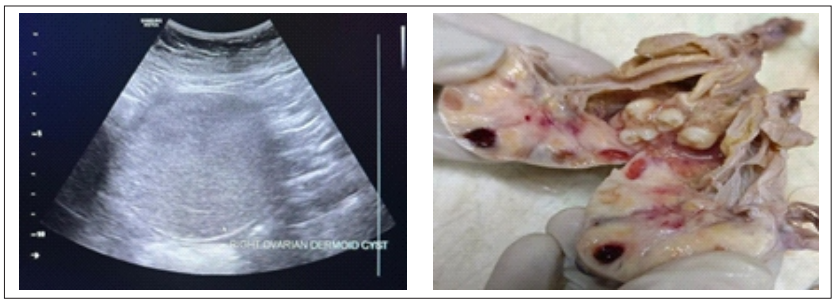

Figure 7: Shows a Ultrasound Image (A) with well-defined Cystic Lesion with Dense Internal Echoes and Calcifications is noted in the right Ovary, Suggestive of a Dermoid , cyst, as confirmed by the Gross Specimen of the Dermoid Cyst Shown (B)

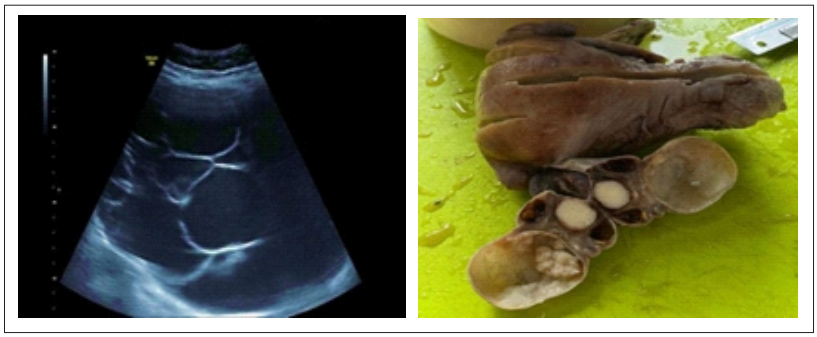

Figure 8: Shows a Ultrasound Image (A) with a well-defined Cystic Lesion with thin Septations within is noted, Suggestive of Mucinous Cystadenoma, as Confirmed by the Gross Specimen of Mucinous Cystadenoma (B)

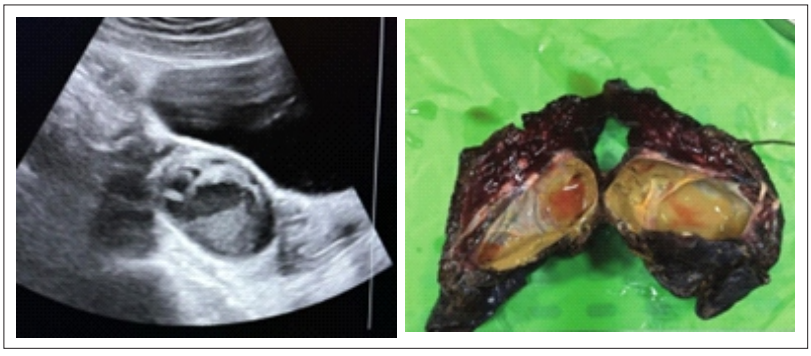

Figure 9: Shows a Ultrasound Image (A)well-defined Cystic Lesion with lace-like Reticular Internal Echoes is noted in the Bilateral Ovaries, Suggestive of a Hemorrhagic Cyst, as Confirmed by the Gross Specimen of Bilateral Hemorrhagic Cyst Shown in (B)

DISCUSSION

In our study, the largest proportion of patients (31.0%) were in the 46-55 years age group, followed by those over 55 years (25.9%). The mean age of the study population was 45.18 years, which is notably higher than that reported in other studies, such as Aruna et al.[5] with a mean age of 30 years, and Al-Shukri et al.[6] with a mean age of 29 years. This difference can be attributed to the demographic characteristics of our cohort, which primarily consisted of middle-aged and older women. The age distribution suggests that adnexal masses are more common or symptomatic in this group, likely due to hormonal changes associated with perimenopause and menopause. This finding is consistent with studies like Adusumilli et al.[7] which reported a mean age of 46 years, emphasizing the increased prevalence of adnexal masses in middle-aged women. These results highlight the need for heightened surveillance and diagnostic focus on this age group to ensure early detection and effective management of adnexal pathologies.

The most common symptoms reported by patients in our study were abdominal pain (44.8%), oligomenorrhea (13.8%), and irregular menstrual cycles (10.3%). Abdominal pain was the predominant symptom, underscoring the significant impact of adnexal masses on patients' quality of life. This finding aligns with studies such as that by Shiva Shankar et al.[8] where abdominal pain was also the leading complaint. Additionally, the occurrence of menstrual irregularities, such as oligomenorrhea, points to potential hormonal disruptions and ovarian dysfunction caused by these masses. The diversity in symptoms further highlights the complexity of adnexal masses, which can present with a broad range of clinical manifestations, emphasizing the need for a personalized and thorough diagnostic approach.[9]

Regarding cyst characteristics, 67.2% of cysts were unilateral, with 32.8% being bilateral, consistent with findings from Prabha et al.[10] Larger cysts (over 10 cm) were more common (58.6%), and 44.8% contained solid components, raising suspicion for malignancy. These findings emphasize the need for thorough diagnostic imaging and further investigation of larger cysts with solid areas, as they are more likely to be malignant and require surgical intervention.

In terms of septations, 39.7% of cysts had no septations, while 24.1% had smooth septations. Irregular or thick septations are typically linked to higher malignancy risk, which supports the importance of detailed imaging in risk stratification. O-RADS scores showed that most cysts fell into categories O-RADS III (44.8%) and O-RADS IV (39.7%), reflecting an intermediate to high risk of malignancy. These findings underscore the utility of the O-RADS system in guiding clinical decision-making for further diagnostic testing and interventions.[11]

Histopathological analysis revealed that endometriotic cysts (19.0%) were the most common diagnosis, followed by benign serous cystadenomas (13.8%) and high-grade serous carcinoma (8.6%). These findings reflect the broad spectrum of adnexal mass etiologies, including benign, borderline, and malignant conditions. The high prevalence of endometriotic cysts underscores the significance of endometriosis-related pathology, while the presence of high-grade serous carcinoma highlights the need for accurate preoperative diagnosis to guide management.

The correlation between ultrasound (USG) findings and histopathological diagnoses showed variability across different cyst types, with ovarian cancer presenting with higher mean USG findings compared to endometriomas and simple cysts. This illustrates the limitations of USG as a standalone diagnostic tool, emphasizing the need for additional imaging methods to enhance diagnostic accuracy. Our study found that radiological methods, particularly MRI, had high sensitivity (93.55%) and specificity (92.59%) for detecting malignancy, supporting their role in differentiating benign from malignant lesions. These results align with previous studies (Dodge et al., Guerra et al.) and further reinforce the value of radiological imaging in guiding clinical management decisions[12]

In our study, Spearman's correlation analysis between radiological and histopathological diagnoses revealed a strong positive correlation ($r = 0.861$, $p = 0.0001$), highlighting the effectiveness of radiological tools in the preoperative assessment of adnexal masses. This strong concordance suggests that imaging, particularly MRI, can reliably predict histopathological outcomes, aiding in early and accurate diagnosis, which is crucial for appropriate management and better clinical outcomes.

Histopathological analysis showed that endometriotic cysts were the most common diagnosis, aligning with findings from other studies (e.g., Aruna et al., Adusumilli et al.). The presence of benign serous cystadenomas and high-grade serous carcinomas further reflects the range of diagnoses reported in the literature (e.g., Prabha et al., Shiva Shankar et al.), emphasizing the need for precise preoperative imaging to guide risk stratification and management decisions.

The distribution of O-RADS scores in our study, with many cases categorized as O-RADS III and IV, mirrors patterns observed in studies by Dodge et al. and Guerra et al.,[15,16] reinforcing the O-RADS system's value in differentiating between benign and malignant masses and supporting its role in clinical decision-making.

Analysis of septations revealed that most cysts had no septations, with a significant number showing smooth septations, which is consistent with findings from Prabha et al. and Adusumilli et al. The presence of irregular or thick septations, often linked to higher malignancy risk, underscores the importance of detailed imaging to stratify

patients based on malignancy risk.

Finally, our study's findings on the variability in USG findings for different cyst types confirm the limitations of USG as a standalone diagnostic tool, as reported in studies by Dodge et al. and Guerra et al. This highlights the need for supplementary imaging techniques, such as MRI, to improve diagnostic accuracy and ensure optimal patient management.

CONCLUSION

This study investigates the demographic, clinical, radiological, and histopathological characteristics of adnexal masses in middle-aged and older women, with a mean age of 45.18 years. Common symptoms included abdominal pain, oligomenorrhea, and irregular cycles, significantly affecting quality of life. Most cysts were unilateral, larger than 10 cm, and contained solid components, increasing the risk of complications and malignancy. The O-RADS scoring system effectively stratified risk, with many patients scoring O-RADS III and IV. Radiological assessments demonstrated high sensitivity and specificity, correlating strongly with histopathological results, supporting the use of O-RADS for improved diagnosis and management.

REFRENCES

1. Talia KL, Parra-Herran C, McCluggage WG. Ovarian mucinous and seromucinous neoplasms: prob-lematic aspects and modern diagnostic approach. Histopathology. 2022 Jan;80(2):255-78.
2. So slow RA. Histologicsub types of ovarian carc inoma : an over view. International Journal of Gynecological Patho-logy.2008Apr1;27(2):161-74.
3. Bandyopadhyay A, Chakraborty J, Chowdhury AR, Bhattacharya A, Bhattachrya P, Chowdhury MK. Fine needle aspiration cytology of ovarian tumorswith histological correlation. Journal ofcytology. 2012Jan1 ;29(1): 35- 40.
4. Hassan RM, Ebrahim SA, Kamal MR, Tantawy HF. The impact of using ovarian-adnexal reporting data system magnetic resonance imaging (O-RADS MRI) score on risk stratification of sonographically indeterminate adnexal masses. Egyptian Journal of Radiology and Nuclear Medicine. 2024 Apr 18;55(1):82.
5. Aruna C, Das IK, Reddy PS, Ghorade RB, Gulhane AR, Kalpande VV, Kajjidoni ST, Hanamaratti NG, Chattannavar SN, Mehtre S, Gholve V. Development of sorghumgeno types for improved yieldan dresistanc eto grain mold using population breeding approach. Frontiers in Plant Science. 2021 Jul 28;12: 687332.
6. Al Shukri M, Al Ghafri W,Gowri V.Are there predictors of early diagnosis of end ometriosis based on clinical prof - ile? A retrospective study. Oman Medical Journal. 2023 Jan;38(1):e458.
7. Adusumilli, S., Hussain, H. K., Caoili, E. M., Weadock, W. J., Murray, J. P., Johnson, T. D., Desjardins, B. (2006). MRI of Sonographically Indeterminate Adnexal Masses.
8. Shankar SS, Banarjee R, Jathar SM, Rajesh S, Ramasamy S, Kulkarni MJ. De novo structure prediction of meteorin and meteorin -like protein for identification of domains, functional receptor binding regions, and their high- risk missense variants. Journal of Biomolecular Structure and Dynamics. 2024 Jun 12;42(9):4522-36.
9. Prabha TV, Patade S, Pandithurai G, Khain A, Axisa D, Pradeep-Kumar P, Maheshkumar RS, Kulkarni JR, Goswami BN. Spectral width of premonsoon and monsoon clouds over Indo-Gangetic valley. Journal of Geophysical Research: Atmospheres. 2012 Oct 27;117 (D20).
10. Brown J, Frumovitz M. Mucinous tumors of the ovary: current thoughts on diagnosis and management. Current oncology reports. 2014 Jun;16:1-9.
11. Prat J. Ovarian carcinomas: five distinct diseases with different origins, genetic alterations, and clinicopatho logical features. VirchowsArchiv. 2012 Mar; 460(3):237-49.
12. Dinauer PA, Brixey CJ, Moncur JT, Fanburg-Smith JC, Murphey MD. Pathologic and MR imaging features of benign fibrous soft-tissue tumors in adults. Radio graphics. 2007 Jan;27(1):173-87.
13. Reid BM,Permuth J B,SellersTA.Epidemiolog yofo variancancer:areview.Cancerbiology& medicine.2017 Feb;14(1):9. Andreotti RF, Timmerman D, Strachowski LM, Froyman W, Benacerraf BR, Bennett GL, Bourne T, Brown DL, Coleman BG, Frates MC, Goldstein SR.O-RADS US risk stratification and management system: a consensusguideline from the ACR Ovarian-Adnexal Reporting and Data System Committee. Radiology. 2020 Jan;294(1):168-85.
14. Liloia D, Cauda F, Uddin L, ManuelloJ, Mancuso L, Keller R ,Nani A, Costa T. Finding the Selectivity of Neuroa natomical Aberration in Autism through Reverse In ference.In GLASGOW OHBM2022 ABSTRACT LIST IN Gs2022 (pp.15-15).Organization for Human Brain Mapping.
15. Dodge S, Weibel R, Forootan E. Revealing the physics of movement: Comparing the similarity of movement characteristics of different types of moving objects. Computers, Environment and Urban Systems. 2009 Nov 1;33(6):419-34.
16. Gungor AA. On chronic rhinosinusitis and the prevalence of fungal sinus disease: problems of diagnostic accuracy and a proposed classification of chronic rhinosinusitis. American journal of otolaryngology. 2012 Sep 1;33 (5):543-8.

How to cite: Gokul Ashok, Devdas Acharya. USG Evaluation of Ovarian Neoplasm with O-Rads Scoring System and Histopathological Correlation. *International Medicine,* 2025; 11 (1) :1-8