

Clinical Profile and Risk Assessment of Adnexal Masses in Post-Menopausal Women Undergoing Surgical Intervention

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Abstract:

Background: Adnexal masses in postmenopausal women represent a significant diagnostic challenge due to varied presentation and increased malignancy risk. Early differentiation between benign and malignant lesions is crucial for optimal management and prognosis.

Aim: To evaluate the clinical profile and assess malignancy risk of adnexal masses in postmenopausal women undergoing surgical intervention.

Methodology: This hospital-based observational study included 80 postmenopausal women with adnexal masses. Clinical, radiological and CA-125 data were assessed and Risk of Malignancy Index (RMI) calculated, followed by surgical management and histopathological confirmation.

Results: Majority of patients were aged 56–60 years. Abdominal pain was the most common symptom. Most masses were unilateral and cystic. Histopathology showed 65% benign and 35% malignant lesions. RMI showed strong positive correlation with malignancy, with highest risk in scores >200.

Conclusion: Adnexal masses in postmenopausal women carry a significant malignancy risk. Combined clinical, imaging and RMI assessment improves early diagnosis and guides timely surgical intervention.

Keywords: Adnexal masses, postmenopausal women, Risk of Malignancy Index, ovarian tumours, histopathology.

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Introduction

Adnexal masses in post-menopausal women pose a significant diagnostic and therapeutic challenge because of their diverse origin and increased risk of malignancy [1]. These masses may arise from the ovaries, fallopian tubes, or surrounding pelvic structures and can be benign, borderline, or malignant. As physiological ovarian cyst formation ceases after menopause, adnexal masses detected in this age group are more likely to have a neoplastic origin, making early evaluation essential.

Clinical presentation is often non-specific, with symptoms such as lower abdominal pain, bloating, urinary frequency, bowel disturbances, and gastrointestinal discomfort. Many lesions are detected incidentally during routine pelvic examinations or imaging performed for unrelated conditions, contributing to delayed diagnosis [2]. The broad spectrum of etiologies includes benign cysts, epithelial tumors, paraovarian cysts, endometriomas, tubo-ovarian abscesses, and ovarian malignancies [3]. Risk factors for malignancy include advanced age, nul-

liparity, early menarche, late menopause, infertility, prolonged estrogen exposure, and inherited genetic syndromes such as BRCA1/BRCA2 mutations and Lynch syndrome.

Accurate diagnosis requires a combination of clinical examination, serum tumor markers, and imaging. CA-125 is the most commonly used biomarker, while carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 (CA 19-9) may assist in identifying specific tumor subtypes [4]. Transvaginal ultrasonography is the first-line imaging modality, with features such as solid components, papillary projections, thick septations, bilateral lesions, ascites, and large tumor size suggesting malignancy. Computed tomography (CT) and magnetic resonance imaging (MRI) are valuable for further characterization and staging of complex lesions [5].

Risk assessment models, particularly the Risk of Malignancy Index (RMI), integrate menopausal status, ultrasound findings, and CA-125 levels to guide clinical decision-making and surgical planning.

However, histopathological examination remains the gold standard for definitive diagnosis. Early identification and systematic evaluation of adnexal masses are therefore crucial for improving outcomes in post-menopausal women.

Methodology

Study Design: This hospital-based observational study employed a retrospective–prospective design to evaluate the clinical profile and risk assessment of adnexal masses in post-menopausal women undergoing surgery. Clinical, radiological, biochemical, and histopathological findings were analyzed to determine the nature of adnexal masses and assess the diagnostic utility of the Risk of Malignancy Index (RMI).

Study Area: The study was conducted in the Department of Obstetrics and Gynaecology, Nalanda Medical College Hospital, Patna, Bihar, India.

Study Duration: The duration of the study was one year from March 2025 to February 2026.

Study Participants

Inclusion Criteria:

- All post-menopausal women presenting with adnexal masses.
- Patients undergoing surgical intervention (emergency or elective) for adnexal mass.
- Patients with complete clinical, radiological, and histopathological records available.
- Patients who provided informed consent for participation in the study.

Exclusion Criteria:

- Patients with incomplete or missing medical records.
- Patients with known primary malignancies of pancreas, colon, breast, cervix, endometrium, or gastrointestinal tract.

- Patients with history of previous major pelvic or abdominal surgery affecting adnexal structures.
- Patients unwilling to participate or not giving informed consent.

Sample Size: The total sample size for the study was 80 post-menopausal women fulfilling the inclusion criteria and undergoing surgical management for adnexal masses during the study period.

Procedure: Eligible patients were evaluated using demographic details, clinical history, physical examination, ultrasonography, and serum CA-125 levels wherever available. Ultrasound findings included assessment of mass size, laterality, morphology, septations, solid or cystic components, and ascites. The Risk of Malignancy Index ($RMI = U \times M \times CA-125$) was calculated for each patient. All patients underwent laparotomy or laparoscopy as appropriate. Intraoperative findings were documented, and excised specimens were subjected to histopathological examination, which served as the definitive diagnosis. Preoperative RMI findings were correlated with postoperative histopathological results.

Statistical Analysis: Data were analyzed using IBM SPSS Statistics version 27.0. Categorical and continuous variables were summarized appropriately. Benign and malignant groups were compared using Chi-square and independent t-tests. Diagnostic accuracy of RMI was assessed, with $p < 0.05$ considered statistically significant.

Result

Table 1 shows that most participants were aged 56–60 years (30%), followed by 51–55 years (22.5%) and 61–65 years (20%). Patients aged >65 years constituted 15%, while 45–50 years had the lowest proportion (12.5%), indicating higher occurrence in older post-menopausal women.

Age Group (Years)	Number of Patients (n)	Percentage (%)
45–50	10	12.50%
51–55	18	22.50%
56–60	24	30.00%
61–65	16	20.00%
>65	12	15.00%
Total	80	100%

Table 2 shows that abdominal pain (42.5%) was the most common presenting symptom, followed by abdominal distension (22.5%), postmenopausal bleeding (15%), and palpable abdominal mass (12.5%).

Incidental detection (7.5%) was least common, indicating varied clinical presentation with pain as the predominant complaint.

Table 2: Presenting Symptoms of Patients (n = 80)

Symptoms	Number of Patients (n)	Percentage (%)
Abdominal pain	34	42.50%
Abdominal distension	18	22.50%
Postmenopausal bleeding	12	15.00%
Palpable mass abdomen	10	12.50%
Incidental finding	6	7.50%
Total	80	100%

“Table 3 shows that right-sided masses (37.5%) were slightly more common than left-sided (35%), while bilateral lesions accounted for 27.5%. Cystic

masses (57.5%) predominated, followed by solid (22.5%) and mixed lesions (20%), indicating a predominance of unilateral, cystic adnexal masses.

Table 3: Laterality and Nature of Adnexal Mass (n = 80)

Variable	Category	Number (n)	Percentage (%)
Laterality	Right side	30	37.50%
	Left side	28	35.00%
	Bilateral	22	27.50%
Nature of Mass	Cystic	46	57.50%
	Solid	18	22.50%
	Mixed	16	20.00%
Total		80	100%

Table 4 shows that benign lesions (65%) predominated over malignant lesions (35%). Serous cystadenoma (25%) was the most common benign tumor, while serous cystadenocarcinoma (17.5%) was the

leading malignant type, emphasizing the importance of histopathological evaluation for accurate diagnosis.

Table 4: Histopathological Diagnosis of Adnexal Masses (n = 80)

Diagnosis Type	Specific Diagnosis	Number (n)	Percentage (%)
Benign (Total 52)	Serous cystadenoma	20	25.00%
	Mucinous cystadenoma	14	17.50%
	Mature cystic teratoma	10	12.50%
	Endometriotic cyst	8	10.00%
Malignant (Total 28)	Serous cystadenocarcinoma	14	17.50%
	Mucinous carcinoma	8	10.00%
	Metastatic ovarian tumor	6	7.50%
Total		80	100%

Table 5 demonstrates a strong positive correlation between RMI score and malignancy. Malignancy increased from 6.7% (RMI <25) to 28.0% (RMI 25–

200) and 76.0% (RMI >200), confirming that higher RMI scores are strongly associated with histopathological malignancy in adnexal masses.

Table 5: Risk of Malignancy Index (RMI) and Outcome Correlation (n = 80)

RMI Score Category	Number of Patients (n)	Histopathology Benign	Malignant (n)	Malignancy Rate (%)
<25	30	28	2	6.70%
25–200	25	18	7	28.00%
>200	25	6	19	76.00%
Total	80	52	28	35.0% overall malignancy

Discussion

The present study demonstrated that the 56–60 years age group had the highest frequency of adnexal masses among postmenopausal women, indicating an age-related increase in disease occurrence. This finding is consistent with the established under-

standing that ovarian neoplasms become more common after menopause because of cumulative genetic alterations and prolonged hormonal exposure. Bhagde et al. (2017) [6] similarly reported that most adnexal masses occurred in women older than 50 years, while Das MJ (2008) [7] observed a higher prevalence during the fifth and sixth decades with an

increased proportion of malignant lesions in older women.

Abdominal pain was the most common presenting symptom, followed by abdominal distension and postmenopausal bleeding. The predominance of pain and distension suggests that many adnexal masses remain clinically silent until they reach a considerable size. Similar findings were reported by Goff et al. (2004) [8], who identified vague abdominal symptoms as important contributors to delayed diagnosis of ovarian malignancies.

A slight predominance of right-sided adnexal masses was observed, although the overall distribution between both sides was nearly equal. Most lesions were cystic, whereas solid and mixed masses were less frequent. These findings agree with Bhagde et al. (2017) [6] and Givens and Mitchell [9], who reported that benign cystic lesions constitute the majority of adnexal masses, while complex or solid lesions are more likely to be malignant.

Histopathological examination showed that benign lesions were more common than malignant lesions. Serous cystadenoma was the predominant benign tumor, whereas serous cystadenocarcinoma was the most frequent malignant tumor. Similar observations were reported by Dotlić et al. (2011) [10].

An important finding was the strong association between increasing Risk of Malignancy Index (RMI) scores and histopathological malignancy. Patients with RMI >200 had a substantially higher likelihood of malignancy, consistent with the findings of Dotlić et al. (2011) [10] and Javedkar R (2015) [11]. Although CA-125 is an important component of the RMI, its diagnostic value alone is limited because elevated levels may occur in benign conditions, as reported by Duffy (2005) [12]. Overall, these findings emphasize the importance of combining clinical evaluation, imaging, tumor markers, RMI, and histopathological examination for accurate diagnosis and timely management of postmenopausal adnexal masses.

Conclusion

Adnexal masses in postmenopausal women were most common in the 56–60 years age group and frequently presented with abdominal pain. Most lesions were benign and cystic, although malignancy remained significant. Higher Risk of Malignancy Index (RMI) scores strongly predicted malignancy. Combined clinical evaluation, imaging, CA-125, and RMI improve preoperative diagnosis, risk stratification, and timely surgical management.

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