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INTEGRATED RISK STRATIFICATION OF ASYMPTOMATIC OVARIAN MASSES IN POSTMENOPAUSAL WOMEN: THE ROLE OF STANDARDIZED ULTRASOUND AND IMMUNOHISTOCHEMICAL PROFILING

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ABSTRACT. Asymptomatic ovarian and adnexal masses are frequently detected in postmenopausal women during routine pelvic ultrasonography or imaging performed for unrelated indications. Although the majority of these lesions are benign, the distinction between low-risk benign masses, borderline tumors, and clinically significant malignancies remains a major diagnostic challenge. In postmenopausal women, unnecessary surgery should be avoided in clearly benign lesions, while potentially malignant tumors require timely identification and referral to specialized gynecologic oncology care.

Objective. To evaluate the diagnostic value of an integrated approach combining clinical risk factors, standardized ultrasonographic assessment, and immunohistochemical profiling for the early identification and biological characterization of ovarian malignancy in asymptomatic postmenopausal women.

Materials and Methods. A focused narrative analysis of contemporary international guidelines, consensus statements, validated diagnostic models, and pathology literature was performed. Clinical risk parameters included age, duration of menopause, hereditary predisposition, previous malignancy, lesion persistence or growth, bilateral involvement, and serum CA-125 when clinically appropriate. Ultrasonographic assessment focused on lesion morphology, including unilocular or multilocular architecture, wall and septal regularity, solid components, papillary projections, Doppler vascularity, ascites, and interval morphological changes. Standardized systems included O-RADS, IOTA Simple Rules, and the ADNEX model. Immunohistochemical profiling included PAX8, WT1, p53, p16, Ki-67, ER, PR, Napsin A, and HNF1β according to histomorphological context.

Results. The available evidence demonstrates that transvaginal ultrasonography remains the principal first-line modality for preoperative risk stratification. Suspicious characteristics include irregular solid tissue, papillary projections, complex multilocular architecture, marked vascularity, ascites, and peritoneal abnormalities. O-RADS, IOTA Simple Rules, and ADNEX provide structured and reproducible classification of adnexal masses and improve differentiation between low-risk and potentially malignant lesions. Clinical factors further modify the pretest probability and may strengthen interpretation of ultrasound findings. Longitudinal morphological changes are also important, as the development of new solid components, papillary structures, wall irregularity, or increased vascularity may indicate increasing malignant potential.

Immunohistochemistry has a complementary rather than screening role and should be performed after tissue acquisition. PAX8 supports Müllerian origin, WT1 is particularly informative in serous tumors, and aberrant p53 expression is strongly associated with high-grade serous carcinoma. Ki-67

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provides information on proliferative activity, while Napsin A and HNF1β are useful in the evaluation of clear-cell differentiation. ER and PR contribute to the characterization of selected endometrioid and serous tumors. Importantly, no single immunohistochemical marker can independently establish malignant transformation; interpretation should always be integrated with conventional histopathology.

Conclusion. The most rational strategy for evaluating asymptomatic ovarian masses in postmenopausal women is a sequential clinical–ultrasonographic–histopathological approach. Standardized ultrasound systems provide preoperative risk estimation, while immunohistochemistry refines final tumor classification and biological characterization after tissue sampling. Integration of O-RADS or ADNEX risk categories with subsequent histopathological and immunohistochemical findings may provide a promising basis for prospective prediction models aimed at earlier recognition of clinically significant ovarian malignancy in postmenopausal women.

Keywords: postmenopause, ovarian mass, ovarian cancer, O-RADS, IOTA, ADNEX, ultrasonography, immunohistochemistry, p53, Ki-67, WT1, PAX8, malignancy risk.

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