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Postmenopausal Ovarian Cysts: Current Management

ABSTRACT

Background

With the increased use of imaging in healthcare (eg, magnetic resonance imaging, computed tomography, sonography), adnexal masses are identified with greater frequency. Ovarian masses, whether primarily cystic or solid in nature, engender concern for ovarian cancer in postmenopausal women.

Objective

Report the experience of the Department of Obstetrics & Gynecology at Gundersen Lutheran Clinic, La Crosse, Wisconsin, with ovarian mass evaluation and treatment regimens in postmenopausal women.

Methods

A computer search of billing databases identified patients over the age of 55 years undergoing sonography at our facility in 2005. These patients' electronic medical records were then reviewed. Forty-nine women met inclusion criteria. Main outcome measures were surgical interventions, ovarian neoplasms, and follow-up intervals.

Results

In 7 patients (14%), the mass had resolved or could not be confirmed at time of evaluation. Fifty percent of women with adnexal cystic masses were managed expectantly. The other 50% of the patients with adnexal cystic masses underwent surgery (8 undergoing laparoscopic procedures). Five malignancies and 3 borderline tumors were diagnosed.

Conclusions

Management of postmenopausal patients with findings of ovarian cysts includes sonography, biochemical markers, and careful judgment. Surgical management is not required in all patients, and minimally invasive surgery can be used for many patients.

Ovarian cysts are diagnosed with increasing frequency as more patients undergo imaging (computed tomography [CT], magnetic resonance imaging [MRI], and sonography) in connection with medical care. An enlarged ovary, or *ovarian cyst*, inevitably raises the question of its relevance to the patient's symptoms and concerns for the possibility of ovarian cancer. The understandable fear of malignancy has driven many patients and their care providers to pursue further testing and surgical investigation. At one time, the mere ability to palpate an ovary in a postmenopausal woman was considered abnormal and grounds for its removal.[1]

Twenty years of increasingly accurate sonography, primarily transvaginal sonography, has demonstrated that benign cysts and tumors are frequent in postmenopausal women.[2–4] Investigators have attempted to correlate sonographic appearance to malignant potential. Morphologic assessment has included the size and number of cysts, the presence or absence of solid elements, and the presence or absence of free peritoneal fluid. Doppler flow studies allow for evaluation of pulsatility and resistance in vessels that supply potential tumors with blood. Measurement of CA-125, a biochemical marker useful in following some patients with ovarian cancer, has been proposed as an adjuvant test.

Combining the above evaluations with the patient's medical history and relevant family history may help in determining whether surgical removal or expectant management is more appropriate. Avoiding unnecessary surgery or invasive or costly testing in the vast majority of patients in whom simple cysts are benign is an important goal.

The following study was conducted to assess the experience of the Department of Obstetrics & Gynecology at Gundersen Lutheran Clinic, La Crosse, Wisconsin, in evaluation of postmenopausal adnexal cysts.

METHODS

This study was performed by the Clinic's sonography service, a shared service of the departments of Obstetrics & Gynecology and Radiology and accredited by the American Institute for Ultrasound in Medicine in obstetrical and gynecological sonography.

The data warehouse was queried, using billing records, to identify women over the age of 55 who underwent pelvic

sonography in 2005 at the Clinic's Department of Obstetrics & Gynecology. Pelvic sonograms were performed 245 times in 229 unique patients. All sonographic examinations were performed on Philips HDI 5000 ultrasound machines by an ultrasonographer and a physician from the Department of Obstetrics & Gynecology.

The Clinical WorkStation (CWS), Gundersen Lutheran Health System's electronic medical record, was utilized to review documentation from those visits to identify those sonograms performed for evaluation of enlarged adnexae or other indications. Patients who were premenopausal or referred for evaluation of postmenopausal bleeding were eliminated from this review. Patients whose medical records contained inadequate documentation were also excluded. No attempt was made to access the sonographic images directly, as these were not then available on CWS. Clinic visit notes, operative notes, and pathology reports for patients who underwent surgery were reviewed.

RESULTS

Forty-nine patients underwent sonography to evaluate a possible pelvic mass found on examination or on another radiological procedure, or for evaluation of abdominal or pelvic pain, fullness or bloating, and/or family history of ovarian cancer. Because these indications were not systematically recorded, the specific indication could not be quantified in this study. Seven patients (14.2%) were found not to have an adnexal mass on sonography, or it had resolved from the time of initial identification. Ten patients underwent 2 sonograms during the period of review.

Many patients had undergone prior diagnostic procedures that led to referral for evaluation (Table 1). Seventeen (35%) had been identified as having an adnexal mass on CT scan. Two patients were noted to have adnexal cystic masses while undergoing renal sonography, and 2 patients were noted to have adnexal cysts on MRI scans. Two patients were referred to Gundersen Lutheran with an adnexal mass noted on sonography or CT scan. Nine patients (18%) were seen for follow-up of cysts previously identified on sonography. Fourteen patients (29%) were noted to have a pelvic mass, or pelvic fullness, on examination. Three patients had no prior diagnostic procedures, but were referred due to pelvic pain.

Table 1. Initial Method of Identification of Possible Pelvic Mass

Method	Number of Patients
Computed tomographic (CT) scan	17
Pelvic examination	14
Previous sonogram	9
Magnetic resonance imaging (MRI) scan	2
Other sonogram (kidney)	2
Outside sonogram	1
Outside CT scan	1

The size of the cysts ranged between 1 and 22 cm. Some reports described the cysts as simple (single, spherical), whereas others were clearly described as multicystic. Presence or absence of solid elements was described in most reports. Use of Doppler flow studies to evaluate the vascularity of the cyst(s) and subsequent description of the Doppler findings were documented in notes from 18 patients; however, in no cases were resistive or pulsatility measures documented. CA-125 levels were measured in 29 patients.

Management strategies were surgery versus observation with repeat sonography. The decision-making involved in this process was not always apparent based on the documentation in these patients' charts. Twenty-one patients underwent surgery to remove the pelvic masses (Table 2). Eight of the 21 patients underwent laparoscopic procedures. Pathology findings are listed in Table 3.

Table 2. Surgical Procedures

Procedure	Number of Patients
Abdominal hysterectomy, bilateral salpingoophorectomy	7
Abdominal hysterectomy, bilateral salpingoophorectomy, staging	3
Laparoscopic removal of adnexae	7
Laparoscopic hysterectomy and bilateral salpingoophorectomy	1
Radical hysterectomy, bilateral salpingoophorectomy	1
Laparotomy removal of adnexae	2

Five malignancies and 3 borderline tumors were identified, with a broad range of benign neoplasms also identified. No complications of surgery were identified.

Table 3. Pathologic Findings at Surgery

Finding	Frequency
Serous cystadenocarcinoma	2
Granulosa cell tumor	1
Leiomyosarcoma	1
Endometrioid adenocarcinoma	1
Borderline serous cystadenomas	3
Benign serous cystadenomas	4
Mucinous cystadenoma	2
Cystadenofibroma	2
Mature teratoma	1
Corpus luteum	1
Hydrosalpinx	1
Paratubal cyst	2

Twenty-one patients were advised to undergo follow-up sonography. The duration advised varied from 1 to 6 months in 10 cases, with the duration not specified in 11 charts. Nine patients had documentation of subsequent sonography at Gundersen Lutheran. One patient did undergo subsequent laparoscopy and removal of a paratubal cyst. No malignant or borderline malignant tumors have been identified in any of the patients initially managed expectantly.

DISCUSSION

Management of postmenopausal ovarian cysts has shifted significantly over the past 20 years. This clinical entity stands at the nexus of 2 complementary evolving technologies: sonographic evaluation of adnexal masses and determination of malignant potential, and management with less invasive surgical options, ie, minimally invasive laparoscopic procedures.

Postmenopausal ovarian cysts are common. Dørum et al identified ovarian cysts of various sizes in 36% of postmenopausal women at time of autopsy.[2] Approximately 3% to 5% of asymptomatic postmenopausal women in screening programs will have an adnexal cyst noted on sonographic studies.[3,4] The vast majority of these cysts are benign, but they all require evaluation and removal or careful follow-up.

In this study, the majority of women referred for sonography had undergone previous sonographic or radiologic imaging. Our finding that many patients (58%) had undergone other diagnostic imaging prior to sonography is new to the literature. Utilization of CT and MRI scans has increased substantially over the years, and incidental cysts are often found. Certainly, the frequency with which incidental cysts are found will vary among clinical practices, depending on CT and MRI utilization rates. The finding of "incidentalomas" subsequently changes the strategies for management, since an increasing proportion of the final outcomes will be benign and will allow for less invasive surgical management options.

The literature on sonography being used to differentiate between malignant and benign ovarian neoplasms originated in a report by Granberg and coauthors in 1989.[5] Since then, an extensive literature has developed on the subject. Studies by Bailey, Modesitt, and others demonstrated that small (<5-10 cm), single, unilocular cysts without evidence of significant solid elements were essentially never malignant in postmenopausal women.[3,6] Several authors developed scoring systems that combined many of these morphological elements into a scoring index intended to aid clinicians in their management decisions.[7-9]

In the early 1990s, researchers evaluating the vascularity of adnexal masses took advantage of the differences in Doppler flow characteristics in vessels supplying blood to normal ovarian tissue and those supplying blood to neoplasms to attempt to further fine tune the ability to differentiate benign from malignant neoplasms.[10,11] Unfortunately, there was significant overlap in findings in malignant and benign cysts, and this modality only slightly improved the specificity of testing regimens. Furthermore, Doppler studies are technically challenging and less reproducible. In this study, we found documentation of Doppler utilization in 43% (18/42) of cases. It is not apparent that this test was used clinically in the decision-making process and may have been more confirmatory in nature. Though experimental and unverified, 3-dimensional sonography has recently been added to the tools used to evaluate neovascularity.[12]

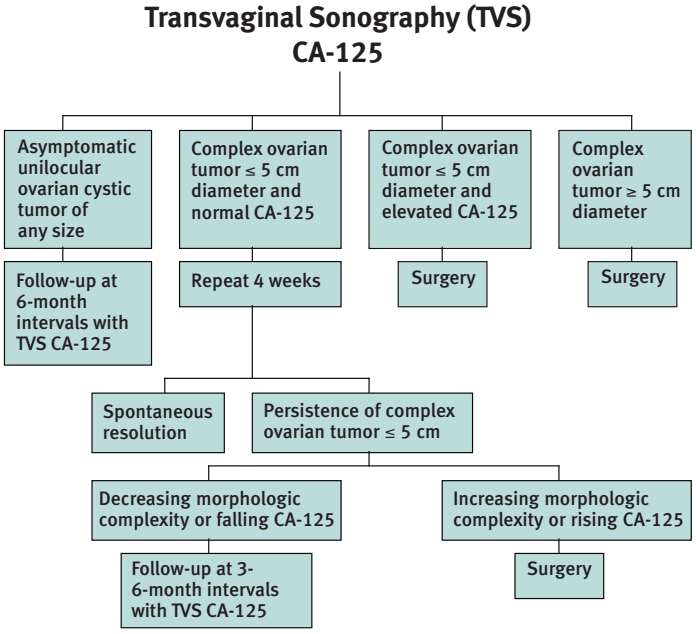
The role for tumor markers, specifically CA-125, has been better defined over the last 2 decades. Approximately 50% of patients with stage I malignant ovarian tumors will demonstrate elevated CA-125 levels, as will more than 90% of those with advanced disease.[13] However, nonmalignant causes of CA-125 elevation are also known. Incorporating this test into scoring algorithms has proven useful in enhancing the negative predictive value of benign appearance on transvaginal sonography, especially in postmenopausal patients. Our providers ordered CA-125 tests in 69% (29/42) of the patients in this review, perhaps as reassurance for those patients with low-risk adnexal masses.

The Agency for Healthcare Research and Quality released an extensive technology assessment of the management of adnexal masses in February of 2006. The sensitivities and specificities for various screening techniques are listed in Table 4. Unfortunately, most studies do not separate premenopausal from postmenopausal women. In general, adding testing modalities increases specificity but does not increase sensitivity. The best strategy appears to be sonography with use of a morphological index, with or without Doppler, and CA-125 testing.[14]

Table 4. Sensitivity and Specificity of Various Methodologies

Methodology	Sensitivity	Specificity
Bimanual examination	0.45	0.9
Sonographic morphological scoring	0.86 - 0.91	0.68 - 0.83
Doppler		
Resistive index	0.72	0.9
Pulsatility index	0.8	0.91
Combined morphology & Doppler	0.86	0.91
Magnetic resonance imaging (MRI)	0.91	0.88
Computed tomography (CT)	0.9	0.75
Positron emission tomography (PET)	0.67	0.79
CA-125	0.78	0.78

In our study, only 5 patients were found to have ovarian malignancies, with 3 more being diagnosed with tumors of low malignant potential. Only 1 of 9 patients for whom we have follow-up information, and who were initially managed expectantly, subsequently underwent surgery. No cancers have been identified in the patients so followed. Expectant management is a successful strategy for patients with low-risk adnexal cysts. In the study by Modesitt et al, 3259 unilocular cysts were diagnosed in 2763 women at least 50 years of age. At an average follow-up of 6.3 years, no woman with a persistent unilocular cyst smaller than 10 cm developed ovarian cancer.[6]



Adnexal cyst management algorithm adapted with permission from van Nagell JR, DePriest PD. Management of adnexal masses in postmenopausal women. *Am J Obstet Gynecol*. 2005;193;34.

This research does not address the controversial issue of whether sonography or CA-125 tests should be utilized to screen for ovarian cancer, especially in patients with a family history of ovarian cancer. While a prevailing concept in cancer management is that early identification will prevent morbidity and mortality, this theory has not been proven in the multitude of studies from screening programs. It is hoped that further research will allow for development of better tests to identify tumors before metastasis, or even in a premalignant state.

Surgical management of ovarian cysts has undergone rapid transition, with minimally invasive laparoscopic techniques becoming used more frequently. Even radical procedures and lymph node sampling have become increasingly common operations done with the aid of a laparoscope. It is anticipated that laparoscopy will become even more commonplace with time.

We acknowledge the strengths and weaknesses of this study and implications for future improvement. The small size of the study is recognized. We also recognize that the current process of documentation, with the inclusion of all sonographic images and reports now being captured in the Picture Archiving and Communication System (PACS) introduced in 2006, will significantly improve follow-up and management. Our sonography unit will consider utilization of a standardized algorithm, such as the version of van Nagell and DePriest provided in the Figure.[15] Finally, a quality improvement process is needed to develop a tracking process for patients advised to return for follow-up sonographic examinations.

In conclusion, the best current recommendation for evaluation of an adnexal mass in a postmenopausal woman remains a transvaginal sonogram. Additional evaluation, perhaps with CA-125 testing and Doppler studies, must be considered. Surgical management should be reserved for patients with high-risk cysts, and less invasive approaches should be used when possible. For patients with cysts having characteristics that support a benign diagnosis, timely follow-up is required.

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