Benign ovarian cysts

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Abstract

Ovarian cysts are common clinical and ultrasound findings. In premenopausal women the vast majority of ovarian masses are benign, as are many of the cysts seen in the postmenopausal patient. The overall incidence of malignancy is 1 in 1000 in a premenopausal patient and 3 in 1000 at the age of 50.

The majority of ovarian cysts are incidental findings and patients are asymptomatic. Approximately 1 in 25 women will have an ovarian cyst causing symptoms at some point in their lives. Once a cyst has been diagnosed it is important to classify its features using transvaginal ultrasonography. This classification in combination with clinical features such as pain, pressure or fertility will guide management. This review will focus on three different types of common ovarian cysts and their management.

Keywords benign; dermoid; endometrioma; ovarian cysts; ultrasound

Introduction

Ovarian cysts are commonly seen in women throughout their lifetime. They are divided into three main groups: functional, benign and malignant (Table 1). In the majority of cases, cysts will be benign and can be managed conservatively. However, symptomatic ovarian cysts are likely to require surgical management. In the premenopausal patient, the risk of a symptomatic ovarian cyst being malignant is 1 in 1000. A thorough history and examination will help aid diagnosis. Transvaginal grey-scale ultrasonography is the most effective investigation to assess ovarian cysts, and experienced ultrasound examiners are able to establish the nature of an ovarian mass at the time of the ultrasound scan using pattern recognition.

Assessment of women with ovarian cysts

A thorough history and examination are important in the assessment of a patient with ovarian cysts, as the diagnosis may be anticipated. Patients should be specifically asked about symptoms suggestive of acute torsion, such as intermittent or severe pain or symptoms of endometriosis, such as dysmenorrhoea, dyspareunia or dyschezia. Symptoms associated with malignancy should also be considered, including abdominal distension, early satiety, urinary urgency or frequency, and abdominal/pelvic pain. Previous gynaecological and surgical history should be elicited, specifically regarding any previous ovarian cysts or breast/bowel malignancy. The family history is important, and should include enquiries about breast or ovarian cancer, bowel or endometrial cancer. Examination should include abdominal and bimanual examination to assess for palpable adnexal masses and any palpable endometriotic nodules. It is important to consider non-gynaecological causes of pain and abdominal distension during assessment.

Investigations

The mainstay of investigations are blood tests (including CA125 in some premenopausal women, LDH, alpha-FP and hCG in women under the age of 40 with complex ovarian masses) and ultrasound. LDH, alpha-FP and hCG are measured to assess the possible risk of germ cell tumours. Transvaginal ultrasonography can pick up ovarian cysts in 28% of postmenopausal patients. Numerous methods have been described to help differentiate between benign and malignant tumours. The Risk of Malignancy Index (RMI) has been traditionally used, and remains the most widely used model. The RMI uses the CA125 combined with ultrasound features and menopausal status to calculate a score:

$$RMI = U \times M \times CA125$$

$\boldsymbol{U} = 0$ (for ultrasound score of 0); $\boldsymbol{U} = 1$ (for ultrasound score of 1); $\boldsymbol{U} = 3$ (for ultrasound score of 2–5).Ultrasound scans are scored one point for each of the following characteristics: multilocular cyst; evidence of solid areas; evidence of metastases; presence of ascites; bilateral lesions.$\boldsymbol{M} = 3$ for all postmenopausal women dealt with by this guideline.***CA125*** is serum CA125 measurement in u/ml.

To estimate the risk of malignancy in premenopausal women, ultrasound features without CA125 levels have been shown to have high sensitivity, specificity and likelihood ratios (Table 2).

However, as serum CA125 can be raised in a number of conditions, including endometriosis, this score can be misleading in premenopausal women. The IOTA group has developed ultrasound based models that have been externally validated. The simple ultrasound rules can be used to classify 75% of masses as benign or malignant (Table 3). A cyst may be classified as benign if at least one ultrasound feature of a benign mass (B-feature) is present, and none of the ultrasound features of malignancy (M-features) are present. The greatest sensitivity and specificity is when the scan is performed and interpreted by an experienced operator.

Management

Once the diagnosis of a benign ovarian cyst has been made, the management will depend on the symptoms and size of the cyst, in addition to the age, medical history and menopausal state of the patient. In premenopausal patients, simple cysts are likely to be physiological and usually resolve spontaneously. Simple cysts larger than 5 cm should be followed up with a yearly ultrasound scan, and those bigger than 7 cm or persistent should be considered for surgery, as these are unlikely to be functional.

In postmenopausal women, management can be stratified according to RMI; options include conservative management,

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Classification of Ovarian cysts

Functional ovarian cysts	Follicular cyst
	Corpus luteal cyst
Benign ovarian cysts	Endometrioma
	Mature cystic teratoma (dermoid)
	Mucinous cystadenoma
	Serous cystadenoma
	Fibroma
	Brenner tumours
Primary malignant ovarian	Germ cell tumour (eg Dysgerminoma)
	Epithelial tumour (eg Mucinous adenocarcinoma)
	Sex-cord (stromal) tumour (eg granulosa cell tumour)
Secondary malignant ovarian	Metastases predominantly from gastrointestinal and breast cancer

Table 1

laparoscopic surgery or rapid referral to a cancer centre for full laparotomy and staging. Aspiration of ovarian cysts is not recommended in the postmenopausal women and bilateral oophorectomy should be considered at the time of operative intervention. Where possible, benign ovarian cysts should be removed via the umbilical port to reduce postoperative pain. Women at low risk of cancer (ie less than 3%) can be managed in a general gynaecology unit, with observation for simple ovarian cysts which are less than 5 cm in diameter with serum CA125 under 30IU. This involves serial ultrasound scans and serum CA125 measurements every four months over a year. Women at moderate risk of cancer (ie 20%) should be offered a laparoscopic oophorectomy in a cancer unit. Those who have a high risk of cancer (ie Over 75%) should be managed in a cancer centre with full staging.

Mucinous cystadenoma

Case 1

A 49 year-old patient is referred to the gynaecology outpatient clinic. She has been referred by her GP with a 3-month history of abdominal distension. The patient has noticed a worsening sensation of abdominal bloating, but does not complain of abdominal pain. She has irregular periods with a normal smear history. She has no other medical or surgical history of note, and is otherwise fit and well.

An example of a protocol for triaging women using the risk of malignancy index (RMI)

Risk	RMI	Women (%)	Risk of cancer (%)
Low	<25	40	<3
Moderate	25–250	30	20
High	>250	30	75

Data from validation of RMI by Prys Davies et al.

Table 2

What next steps would you take?

A full history should be taken and the presence or absence of red flag symptoms confirmed. Red flag symptoms include persistent abdominal distension, urinary urgency occurring 12 times a month, early satiety and pelvic/abdominal pain. The examination may provide clues as to whether the mass is an enlarged uterus or a mass arising from the adnexae. A transvaginal or transabdominal scan is the first line investigation.

Ultrasound findings

The scan report notes that the uterus is anteverted with a morphologically normal endometrium. The right ovary is normal. In the left adnexa there is a large cystic mass seen measuring 60 × 42 × 97 mm. There is normal ovarian tissue seen surrounding this cyst. The cyst is thin-walled and smooth. It is multi-loculated and contains viscous material. The cyst and ovary are poorly vascularised. There is no ascites. There are no peritoneal deposits. The scan was also performed transabdominally in view of the size of the cyst. These features are suggestive of a mucinous cystadenoma.

Pathophysiology

A mucinous cystadenoma is a benign epithelial tumour. They are the commonest benign ovarian cyst and account for approximately 20–25% of ovarian cysts. They are usually unilateral and multi-locular (bilateral in 2–5% cases) and the incidence tends to peak at 30–50 years of age. At the point of presentation, these cysts may be large in size and can grow to 30 cm or more. They are thin-walled and produce mucin, which fills the locules. This fluid ranges from watery to thick mucinous fluid. They may also be unilocular. The aetiology of mucinous cysts is unknown, but they may be associated with other ovarian tumours such as mature cystic teratomas.

What is the natural progression of mucinous cystadenomas?

Mucinous cysts of the ovary are benign in 80% of cases, borderline in 10% and malignant in 10%. The patient can be reassured that the majority of these cysts are benign and in the absence of malignant features conservative management is an option. Mucinous cysts that are benign are often large and the patient can be reassured that size alone does not increase the likelihood of malignancy. Ultrasound features that increase the suspicion of malignancy are:

- Solid areas or papillary projections within the cyst
- Loss of any normal ovarian tissue surrounding the cyst.

Borderline tumours can be difficult to differentiate from benign tumours on the basis of their gross features and the sensitivity of ultrasound diagnosis of borderline tumours is low (69%), although specificity is high.

What are the management options for this patient?

With regards to ongoing management the patient should be informed that given its size, the cyst is unlikely to resolve spontaneously without intervention, and likely to grow larger with time.

Large dermoid cysts and cystadenomas do not spontaneously regress and therefore surgery is likely to be warranted, particularly if causing symptoms. A laparoscopic cystectomy would be the