Brighton and Sussex University Hospitals NHS Trust

Ovarian Cysts

Management of Asymptomatic Ovarian Cysts in Pre and Post-Menopausal Women

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Key Principles

These guidelines and algorithms are aimed to assist in the initial assessment and management of ovarian masses in pre and post-menopausal women. The guideline also aims to assist triaging where ovarian masses should be managed. They are not designed to be prescriptive and you are not expected to use them in exclusion of discussion with senior colleagues.

Evidence used to inform these guidelines have been drawn from:
RCOG – Guideline No. 62 (2011) – Management of suspected ovarian masses in premenopausal women
RCOG – Guideline No. 34 (2003) – Ovarian cysts in Postmenopausal Women Management of Asymptomatic Ovarian and Other Adnexal Cysts Imaged at U/S: Society of Radiologist in Ultrasound Consensus Conference Statement (2009

Scope

This guideline applies to:
- Patients with asymptomatic simple or haemorrhagic ovarian cysts
- All Sonographers/ Radiologists/ Gynaecologists who are performing gynaecological ultrasound examinations
- All clinicians who are managing patients with pelvic masses

Responsibilities

<u>Nurses, Midwives, Radiologists, Sonographers, Obstetricians & Gynaecologists</u>:
- To access, read, understand and follow this guidance
- To use this guideline when writing protocols and policies for maternity care

<u>Management Team :</u>
- To ensure the guideline is reviewed as required in line with Trust and National recommendations
- To ensure the guideline is accessible to all relevant staff

1.0 Objective Standards

1.1 Definitions

- A simple asymptomatic ovarian cyst, as diagnosed with ultrasound imaging, is a thin and smooth-walled anechoic space with no flow within using colour Doppler which is often found incidentally and is not accompanied by symptoms of pain. However up to 20% of borderline tumour can appear as a simple cyst particularly if the cyst is large.

- A classic haemorrhagic ovarian cyst has the following ultrasound features: a cystic mass with a reticular pattern of internal echoes (often referred to as fishnet, cobweb, spider web, generally due to fibrin strands) and/or a solid-appearing area with concave margins. No internal flow with colour Doppler is seen, and there is usually circumferential flow in the wall of the cyst. Wall thickness can be variable.

- Other adnexal masses are described below

1.2 Background

- The majority of ovarian masses and cysts are benign in premenopausal women. The sonographic appearance of a normal ovary has a varying appearance throughout the menstrual cycle which may include multiple developing follicles, one or more dominant follicle and a corpus luteum. At ultrasound the follicles appear as multiple, thin and smooth-walled, round or oval, anechoic spaces with no flow using colour Doppler (i.e. the appearance of a simple cyst). The size of a dominant follicle at ovulation averages 2-2.4cm with a range of 1.7 – 2.8cm. Therefore cysts of < 3cm should be considered a normal physiological finding.

- After ovulation, the dominant follicle becomes a corpus luteum. This is typically a diffusely thick-walled cyst with crenulated inner margins, measuring < 3cm in maximum diameter. It usually has internal echoes and a ring of vascularity at the periphery seen using colour Doppler.

- After menopause, folliculogenesis ceases and the ovaries decrease in size. The normal post-menopausal ovary typically appears small and homogenous in echotexture. Small simple cysts become less frequently observed as patient progresses through the menopause transition. Some of these cysts seen in early menopause may reflect an ovulatory event, and others may be para-ovarian or tubal

in origin. Even in late menopause, where ovulation is unlikely to occur, small simple cysts up to 1cm may be seen in up to 21% of women.

- The incidence of simple ovarian cysts found using ultrasound, particularly in pre-menopausal women, is high and the cause of many repeat scans.

- Functional and simple cysts which are less that 50mm maximum diameter usually resolve over 2 to 3 menstrual cycles without any need for intervention. Table 1 describes the different types of adnexal masses,

Table 1. Types of adnexal masses

Benign ovarian	Functional cysts Endometriomas Serous cystadenoma Mucinous cystadenoma Mature teratoma
Benign non-ovarian	Paratubal cyst Hydrosalpinges Tubo-ovarian abscess Peritoneal pseudocysts Appendiceal abscess Diverticular abscess Pelvic kidney
Primary malignant ovarian	Germ cell tumour Epithelial carcinoma Sex-cord tumour
Secondary malignant ovarian	Predominantly breast and gastrointestinal carcinoma

1.3 Pathogenesis

- The most common reason for finding a simple ovarian cyst is due to the persistence and growth of a follicle.The pathogenesis of late post-menopausal cysts up to 1cm is

unclear but may be seen in up to one fifth of patients. It is considered of no clinical importance and would not require follow-up.

- Haemorrhagic ovarian cysts are generally due to expanding haemorrhage within a corpus luteum or other functional cyst. They typically resolve within 8 to 12 weeks and will alter in appearance over time. No internal colour flow will be seen at colour Doppler.

2.0 Diagnosis Pathway

Diagnosis is made by good quality ultrasound images, preferably using the trans-vaginal route and sometimes requiring both trans-vaginal and abdominal methods.

Ultrasound of the female pelvis:

- The patient should receive an information sheet prior to the examination outlining the procedure.
- Explanation of the procedure and verbal consent should be obtained prior to proceeding.
- A chaperone should be present during the examination or at least offered if staffing does not allow one to be present at all times.
- A chaperone is essential when the clinician performing the scan is male
- History of latex allergy and patient ID should be checked prior to performing the examination.
- Patient needs to empty their bladder immediately prior to a vaginal examination or have a full bladder for an abdominal approach.
- Patients ID should be entered on the machine.
- Probe should be cleaned and a probe cover applied over the vaginal transducer if used.
- Procedure performed in a manner to preserve modesty.
- Images recorded of size, shape and echotexture of uterus, endometrium, ovaries and adnexae.
- Any abnormalities should be measured and recorded.
- Any cyst should be checked for size (max. diameter), wall thickness, presence and number of septae, presence of solid components, colour flow within septae and/or solid components.

2.1 Technical Aspects

- The entire cyst needs to be adequately imaged – there will be occasional incidences when this is not technically possible and reliable characterisation is not obtained

with ultrasound. This is most likely to occur with large cysts and is also why simple cysts > 5cm, despite being unlikely to show malignant change, should be followed-up in case a small solid area is missed/cyst incompletely imaged. Both transabdominal and transvaginal scans may need to be done to adequately image a large cyst.

- Colour or Power Doppler is needed for evaluation of most complex cysts and to ascertain whether hypoechoic areas or potential artefact are solid or not.
- Presence of flow within a cyst is the most important Doppler feature rather than spectral Doppler values.
- Measurements of cysts in 3 –dimensions can be modified by pressure with the vaginal probe with variability in accuracy of measurements. The measurement of the maximum diameter of the cysts is the recommendation.

3.0 Clinical Information

If not present on the request form, the following information is considered pertinent to the examination:

- Patients age
- Last menstrual period
- Relevant signs and symptoms
- Hormonal status (OCP, HRT or fertility drugs)
- Personal or family h/o Cancer
- History of prior surgery
- Results of previous investigations/scans

4.0 Menopausal Status

4.1 Definition

A strict definition of menopause, especially early menopause is difficult because it represents a continuum. The ovaries may appear somewhere in the spectrum between pre and post-menopausal. The average age for menopause is 51-53 years in Western countries with a wide variation from 40 – 60years.

Post menopause is defined as 1 year or more of amenorrhoea from the final menstrual period. Physiologically, this time can be divided into early (1- 5years) and late (>5years) post menopause, but for the purpose of simplicity the first definition is to be used.

5.0 Reporting Simple Ovarian Cysts

5.1 Pre-Menopausal

- Cysts ≤ 3cm: Normal physiological findings. Writing findings in the report is up to the discretion of reporting clinician. No follow-up.
- Cysts > 3cm ≤ 5cm. Report and describe. Do not need follow-up.
- Cysts > 5cm. Rescan in 6/12. If resolved no follow up. No change or increase in size – Gynae referral.
- Cysts > 7cm are difficult to assess with U/S, recommendation for MRI & Refer to Gynaecology

5.2 Post-Menopausal

- Cysts ≤1cm clinically inconsequential. Up to clinician whether to describe in report. No follow-up.
- Cysts > 1cm ≤ 5cm. Describe and repeat scan in 6/12. If resolved, no follow-up. No change or increase in size – Gynae referral.
- Cysts > 5cm. Gynae referral.

The same recommendations/pathway is suggested for classic haemorrhagic cysts in the pre-menopausal patient. If there is any doubt about the U/S features they should be treated as complex cysts.

In post-menopausal patients – ALL non-simple cysts should be referred for a gynaecological opinion.

5.3 Complex Cysts

All of the following cysts should have Gynae referrals regardless of menopausal status:

- **Endometrioma** – homogenous low level internal echoes. No solid component+/- tiny echogenic foci in walls.
- **Dermoid** – features to make confident diagnosis are; Focal or diffuse hyperechoic components, Hyperechoic lines and dots, an area of acoustic shadowing, No internal flow with colour Doppler. Malignant change most common in women > 50years and cysts >10cm.
- **Hydrosalpinx** – tubular-shaped cystic mass
  +/- Short, round projections
  +/- Waist sign (indentations on opposite sides)
  +/- seen separate from ovary
  If classic features no further follow up is required to establish diagnosis. If not classic alternative imaging may be required. Frequency of follow up as clinically indicated.

- **Peritoneal Inclusion Cyst** – follows contours of adjacent pelvic organs. The ovary is at the edge or suspended within the mass. Can have septations. If classic features no follow up required. If not classic further imaging may be required.

- **Indeterminate but probably Benign Cysts**
  1) Simple cyst with thin septation or focal calcification in wall.
  2) Non classic haemorrhagic/endometrioma/dermoid/multiple septae/solid nodule with no colour flow NB Cysts > 10cm have a 13% chance of being malignant.

- **Complex Cysts - suspicious of malignancy**
  1) Thick, irregular septations > 3mm.
  2) Nodule with blood flow.

  GP patient – write unexpected finding on report, Fax report to GP and refer to Gynae.

6.0 Tumour Markers

Consider sending serum CA125 but result should be interpreted with caution as it is raised in numerous benign conditions including fibroids, endometriosis, adenomyosis and pelvic infection especially in pre-menopausal women. Usually the CA 125 levels are less than 200 units/ml in these circumstances. Serial CA 125 monitoring may also be considered as rapidly rising levels are more likely to be associated with malignancy. If CA 125 levels are more than 200 units/ml, please discuss with a gynaecological oncologist. It is also important to note that only 50% of early stage epithelial carcinoma of the ovary has a raised CA 125.

Alpha fetoprotein and HCG should also be measured for women under 40 years old with a complex ovarian mass because of possibility of germ cell tumours.

7.0 Triaging Ovarian Masses

Triaging is important to decide which cases are best managed by a general gynaecologist or a gynaecological oncologist.

7.1 Risk of Malignancy Index (RMI)

RMI combines 3 pre-surgical features of serum CA 125 (CA125), menopausal status (M) and ultrasound score (U). RMI = U x M x CA125

- The ultrasound result is scored 1 point for each of the following characteristics: multilocular cysts, solid areas, metastases, ascites and bilateral lesions. U = 0 (for an ultrasound score of 0), U = 1 (for an ultrasound score of 1), U = 3 (for an ultrasound score of 2–5).
- The menopausal status is scored as 1 = premenopausal and 3 = postmenopausal. Postmenopausal can be defined as women who have had no period for more than one year or women over the age of 50 who have had a hysterectomy.
- Serum CA-125 is measured in IU/ml and can vary between zero to hundreds or even thousands of units.

Table 2: An example of a protocol for triaging women using the risk of malignancy index (RMI); data from validation of RMI by Prys Davies *et al.*16

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

Patients that are of moderate and high risk will need to be discussed with a gynaecological oncologist.

7.2 IOTA Ultrasound features classification

The IOTA Group has published the largest study to date investigating the use of ultrasound in differentiating benign and malignant ovarian masses. Using data derived from the IOTA Group, simple ultrasound rules were developed to help classify masses as benign (B-rules) or malignant (M-rules) (see Table 3). Using these rules the reported sensitivity was 95%, specificity 91%, positive likelihood ratio of 10.37 and negative likelihood ratio of 0.06.

Table 3: IOTA Group ultrasound 'rules' to classify masses as benign (B-rules) or malignant (M-rules)

B-rules	M-rules
Unilocular cysts	Irregular solid tumour
Presence of solid components where the largest solid component <7 mm	Ascites
Presence of acoustic shadowing	At least four papillary structures
Smooth multilocular tumour with a largest diameter <100 mm	Irregular multilocular solid tumour with largest diameter ≥100 mm
No blood flow	Very strong blood flow

8.0 Management of Ovarian Masses Presumed To Be Benign

- Women with small <50mm diameter simple ovarian cyst do not require follow up as the cyst are likely to be physiological and almost always resolve within 3 menstrual cycle. In postmenopausal women it is reasonable to offer a repeat ultrasound after 4 months as 50% may resolve after 3 months. Conservative management need to take into account the background risk of ovarian cancer in the woman and symptoms.

- Women with simple ovarian cyst of 50 to 70mm in diameter should have yearly ultrasound follow up and those with larger simple cysts (>70mm) should be considered for further imaging i.e. MRI or surgical intervention. In postmenopausal women, surgical intervention can be offered with a view for bilateral oophorectomy.

- Ovarian cysts that persist or increase in size are unlikely to be functional and may warrant surgical management

- Aspiration of cyst has not been shown to be effective and is associated with high risk of recurrence as high as 84%

- Where possible, cysts should be removed intact or use a tissue bag to avoid peritoneal spillage of cystic contents.

- The possibility of oophorectomy should always be discussed preoperatively

9.0 References

1. RCOG Guideline No. 34 (2003) – Ovarian cysts in Postmenopausal Women
2. RCOG Guideline No. 62 (2011) – Management of suspected ovarian masses in pre-menopausal women
3. Management of Asymptomatic Ovarian and Other Adnexal Cysts Imaged at U/S: Society of Radiologist in Ultrasound Consensus Conference Statement (2009)DePriest PD, Varner E, Powell J, Fried A, Puls L, Higgins R, et al. The efficacy of a sonographic morphology index in identifying ovarian cancer: a multi-institutional investigation. GynecolOncol 1994