

# Management of a pelvic mass

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## Abstract

Pelvic masses are a common clinical presentation in gynaecology. The possible diagnoses are variable, as are the management strategies. A comprehensive knowledge of the potential aetiologies and a logical approach to history-taking, examination and investigation are essential. This problem-based review presents three case histories that illustrate the key principles in the management of a pelvic mass. The cases describe commonly encountered scenarios with an evidence-based approach to subsequent management.

**Keywords** management; ovarian neoplasm; pelvic mass; pregnancy; surgery

## Introduction

A pelvic mass can arise from various organs including the fallopian tubes, ovaries, uterus, bladder, bowel and retroperitoneal structures. To establish a diagnosis requires a thorough history, examination and appropriate investigations. There is an extensive differential diagnosis (Table 1) and the treatment options are numerous. The following three cases illustrate some key issues in the investigation and management of pelvic masses.

## Case 1

A 58-year-old woman was referred by her general practitioner after a pelvic mass was detected during a routine cervical smear test. The smear was subsequently reported to be normal. The patient was asymptomatic with no history of post-menopausal bleeding, pelvic pain or bowel symptoms. Her medical history included a midline laparotomy for a ruptured appendix in her 20s and a chlamydial infection in her 30s. She was nulliparous with uninvestigated primary subfertility, and had received six cycles of *Clomid* without success. There was no family history of ovarian or breast cancer.

Examination of the abdomen showed extensive scarring from the previous midline laparotomy; however, the mass was not clinically palpable. Pelvic examination revealed a normal vulva, vagina and cervix, and the uterus was of normal size. A smooth-walled, non-tender, mobile mass was detected in the right adnexa. Triple swabs were negative. C-reactive protein (CRP) and WBC

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## Differential diagnosis of a pelvic mass

| Organ          | Causes   |
|----------------|--|
| Ovary          | Functional cyst<br>Benign tumour/cyst<br>Malignant tumour/cyst<br>Endometrioma<br>Ovarian hyperstimulation syndrome      |
| Uterus         | Pregnancy<br>Fibroids (subserosal, intramural)   |
| Fallopian tube | Broad ligament<br>Hydrosalpinx<br>Tubo-ovarian abscess<br>Ectopic pregnancy<br>Fimbrial cyst<br>Fallopian tube carcinoma |
| Bowel          | Appendix abscess<br>Diverticular disease<br>Colorectal carcinoma<br>Constipation   |
| Miscellaneous  | Urinary retention<br>Pelvic kidney<br>Retroperitoneal neoplasm<br>Lymphoma   |

**Table 1**

count were normal. Cancer antigen 125 (CA-125) was 8u/ml and carcinoembryonic antigen CEA was less than 1 µg/l.

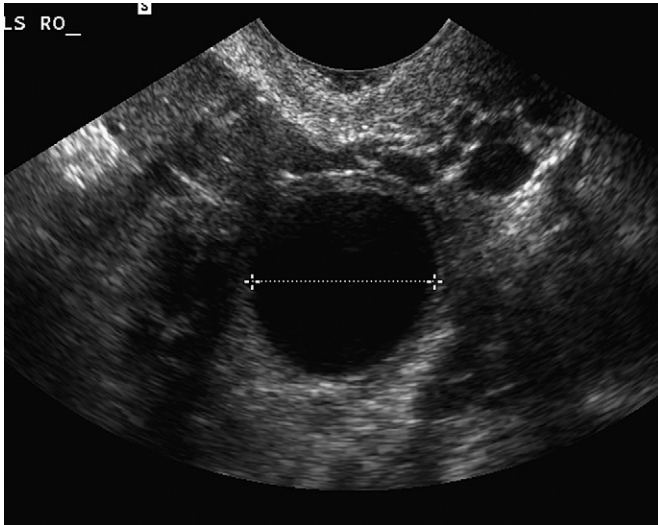
Transvaginal pelvic ultrasonography demonstrated a 60 × 56 × 56 mm right-sided cystic structure that was thin walled, bilocular and with no solid elements. No ascites was seen, and neither ovary was visualized separate to the cyst (Figure 1).

## Discussion

The detection of asymptomatic ovarian cysts in post-menopausal women is relatively common, with a prevalence of 2–6%. As in this case, they can present following a routine examination or incidentally during investigations for other reasons. Before the introduction of ultrasound imaging, any pelvic mass detected clinically was considered an indication for laparotomy. As most ovarian cysts are benign, the use of ultrasonography and other investigations means that not all pelvic masses require surgical management.

This patient is post-menopausal; therefore, the cyst is unlikely to be functional. If the patient were pre-menopausal, it would probably be too large to represent a follicular cyst, as these tend to be less than 4 cm in diameter. The cyst is asymptomatic without any suspicious symptoms consistent with an ovarian malignancy such as weight loss, gastrointestinal disturbance or pain. When considering potential treatments, and their associated morbidities and potential complications, it is important to remember that the patient is currently fit and well and her cyst is asymptomatic.

Various aspects of the patient's history affect the likelihood of malignancy. There is no family history of ovarian, breast, endometrial or colorectal cancer, which can be associated with cancer



**Figure 1** Transvaginal ultrasound image of simple ovarian cyst. Note the thin, smooth capsule with no evidence of internal echoes.

predisposition syndromes; however, being nulliparous, post-menopausal and having unsuccessfully used ovulation-induction agents all increase the risk of malignancy.

The examination findings highlight the importance of pelvic examination, as the cyst was detectable only on bimanual palpation. The fact that it is smooth, mobile and non-tender makes the diagnosis of advanced ovarian cancer or pelvic abscess less likely.

The sonographic appearances of the cyst are reassuring and can be more formally represented by combination with serum CA-125 and menopausal status to produce a risk of malignancy index (RMI) of 24 (Table 2). This suggests that the cyst is unlikely to be malignant, though this test is not diagnostic, having a sensitivity of 70% (using 250 as a cut-off value). The CA-125 level is within

the normal range (< 30 u/ml), but it must be noted that not all ovarian cancers produce elevated CA-125 levels; up to 50% of cases of early-stage disease have a normal CA-125. CA-125 is also relatively non-specific, as it is raised in other situations such as menstruation, pelvic inflammatory disease (PID) and endometriosis. The patient's age is valuable when interpreting a raised CA-125 level, as this is associated with malignancy in less than 25% of patients under 50 years of age and in 80% of patients over 50 years. This is reflected in the use of menopausal status in the RMI.

A tubo-ovarian abscess should always be considered in women with a previous history of PID, but is unlikely in this case as the swabs, WBC count and CRP are normal and the cyst is non-tender. Previous PID can produce a confusing picture on ultrasonography, the appearance of a hydrosalpinx being mistaken for a simple ovarian cyst. The patient underwent previous laparotomy for a ruptured appendix, from which extensive adhesions may have formed; this increases the potential risk of bowel injury and other associated complications of any further surgery. Extensive intraperitoneal adhesions can also produce a confusing picture on ultrasonography; pockets of scarring producing pseudocysts can mimic the appearance of ovarian cysts.

Currently, there is no evidence that any further imaging helps in determining the nature of a cyst. However, there may be a role in the future for magnetic resonance imaging, three-dimensional ultrasonography, colour flow Doppler and positron emission tomography.

There are numerous potential diagnoses, and the risk of missing a malignancy by adopting conservative management must be balanced against the potential morbidity of surgery. Since the RMI is low and the potential risks of surgery so high, a conservative approach to management could be taken as the risk of ovarian cancer is less than 3%. Aspiration of the cyst is not recommended as the diagnostic accuracy of cytology of

### Calculation of risk of malignancy index (RMI) and an example of a triaging protocol

#### Calculation of RMI

$$\text{RMI} = \text{ultrasound score} \times \text{menopausal status} \times \text{CA-125}$$

|                   |   |                                 |
|-------------------|---|---------------------------------|
| Ultrasound score  | 0 | No suspicious features          |
|                   | 1 | One suspicious feature          |
|                   | 3 | Two to five suspicious features |
| Menopausal status | 1 | Pre-menopausal                  |
|                   | 3 | Post-menopausal                 |
| CA-125 in u/ml    |   |                                 |

Ultrasound features: multilocular cyst; solid areas; evidence of metastases; bilateral lesions and presence of ascites

#### Risk assessment according to RMI\*

| Risk     | RMI    | Percentage of women | Risk of malignancy |
|----------|--------|---------------------|--------------------|
| Low      | <25    | 40%                 | <3                 |
| Moderate | 25–250 | 30%                 | 20                 |
| High     | >250   | 30%                 | 75                 |

Source: Davies AP, et al. *Br J Obstet Gynaecol* 1993;100:927–31.

**Table 2**

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