Background
The detection of pelvic mass with an associated elevated CA 125 is highly suspicious of ovarian cancer, but there are various benign conditions which mimic the above findings, especially in premenopausal women.

Case presentation
A 19 year old nulliparous, British Caucasian woman was admitted with a sudden onset of right iliac fossa pain. Urine pregnancy test was negative. This pain was sharp and stabbing in nature with no radiation. There was no associated vomiting or fever. She denied any urinary urgency, frequency or dysuria and her bowels were normal. On examination there was minimal guarding and no rebound tenderness. No distension was seen and bowel sounds were heard. Transvaginal pelvic ultrasound demonstrated two small simple cysts within the right ovary. She was managed conservatively with analgesics only and the pain resolved within 24 hours. Following this acute episode she developed intermittent pelvic pain. Her subsequent scan showed 9.8 × 4.5 cm complex cystic mass in right adnexa with features suggestive of a dermoid cyst with no colour flow on Doppler examination. Interestingly her CA 125 was markedly elevated at 657; CEA, FP, HCG, white cell count (WCC) and CRP were all within normal limits. Her periods were regular and she was using condoms for contraception. She was in a new relationship and they had been together for the last 4 months.

Past medical history included well controlled asthma, a negative laparotomy at the age of seven for abdominal pain but no previous pelvic infections. Pelvic examination revealed a normal size uterus with a right adnexal mass which appeared fixed to the pelvic side wall.

A subsequent CT scan one week later suggested a right adnexal dermoid cyst 5.4 × 4.8 cm with abnormal soft tissue 3.0 × 2.6 cm deep to right rectus muscle and abnormal irregular soft tissue along pelvic side wall extending from left common iliac bifurcation to left adnexa and an enlarged 10 mm precaval lymph node was also seen. These features were thought to be highly suspicious of malignancy during the case review at the Gynaecology oncology Multidisciplinary Team (MDT) meeting.

A further CA 125 level was measured pre-operatively and had fallen to 342. A provisional diagnosis of either pelvic inflammatory disease, endometriotic cyst or an ovarian malignancy was made. She underwent a midline laparotomy that revealed right ovarian cyst (7 × 6 × 6 cm), with associated hydrosalpinx. The tubo-ovarian mass was adherent to the terminal ileum, caecum and...
The combination of pelvic mass and elevated level CA 125 arouses suspension of a gynaecological malignancy, but other conditions should always be considered in the differential diagnosis, especially in a pre menopausal female. Malkasion[7] studied 59 patients with histologically proven benign ovarian cysts. Out of these patients 17 had elevated concentrations of CA 125 (12 > 35 units/ml, 4 > 65 units/ml and 1 > 2000 units/ml). In another study by Dixia[8] using 153 patients with benign pelvic masses, 10 patients had CA 125 concentrations >188 units/ml and one patient had a value of more than 400 units/ml. Nolen et al screened 65 biomarkers in patients with adnexal masses and more than half of the biomarkers differed significantly between benign and malignant masses. CA 125 and HE4 in combination provided the highest discrimination between benign and malignant cases[9]. These studies demonstrate that using CA 125 in isolation has a limited value in differentiating benign from malignant pelvic masses. The patient characteristics and radiological information provides crucial additional information on which to base a diagnosis.

Pelvic ultrasound in conjunction with CA 125 represents the most frequently utilised investigations for patients with adnexal masses. CT scan has limited value in the initial assessment of adnexal masses due to poor soft tissue discrimination and with disadvantages for irradiation[10], but can help to assess the extent of disease in the upper abdomen prior to primary cytoreduction and following chemotherapy to detect resistant disease or recurrence[11]. The CT scan in the current case was misleading, with irregular pelvic side wall soft tissue and pre-caval lymph node assumed to be malignant most likely representing inflammation from the Chlamydia infection. MRI has also been suggested to be helpful in detection of organ of origin for pelvic masses. MRI has a sensitivity of 96% while it was only 77% for Ultrasound and 87% for CT for detection of pelvic masses. MRI has been shown to correctly identify organ of origin in 94% compared to only 66% of Ultrasound[12]. Review of literature from 1990 to 2006 which included 143 studies showed that Ultrasound findings were similar to CT and MRI in differentiation of benign from malignant ovarian masses[13]. Currently newer imaging in the form of Positron emission tomography (PET) and CT can be used to judge the extent of the disease and also differentiate between malignant and benign masses [14]. As it is evident from above studies all the modalities are complimentary to each other with ultrasound remaining the first diagnostic modality as it is cheap and widely available in all units. Further assessment of the spread of disease can either be made by CT or MRI and PET scanning where facilities exist.

As the CA 125 molecule is identified in normal peritoneal and fallopian tubes, it is not surprising that inflam-
mation of these tissues can result in an increased concentration of serum CA 125. Ruibal et al[15] found that nine of twelve women with suspected peritonitis had CA 125 concentrations of > 65 units/ml with two patients having value > 500 units/ml. A more definitive study examined CA 125 values in 30 patients with pelvic inflammatory disease associated with fever who had a good response to antibiotic therapy. CA 125 > 100 units/ml was seen in 5 patients (17%) and the highest value was 550 units/ml[16]. This increased serum concentration of CA 125 can be explained by the local expression by the inflamed tissue. Another study of 33 patients with pelvic inflammatory disease showed that 32 patients had increased concentrations of CA 125 with values between 100 and 1300 units/ml[17].

In the current case the key finding of a reduction in CA 125 between the serial measurements suggested that the elevation witnessed may be of benign origin. This is reflected in the well documented exponential rise in CA 125 levels described in ovarian malignancy[18].

**Conclusion**

The presence of a pelvic mass with a raised CA 125 of 657 units/ml, lymphadenopathy and other associated suspicious features on CT scan suggested an ovarian malignancy. A subsequent fall of CA 125 to 342 units/ml was seen in 5 patients (17%) and the highest value was 550 units/ml[16]. This increased serum concentration of CA 125 can be explained by the local expression by the inflamed tissue. Another study of 33 patients with pelvic inflammatory disease showed that 32 patients had increased concentrations of CA 125 with values between 100 and 1300 units/ml[17].

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**Consent**

Written informed consent has been obtained from the patient for publication of this case report.

**Competing interests**

The authors declare that they have no competing interests.

**Authors’ contributions**

VH was involved in pre and post operative care of the patient and wrote the manuscript. RH and TJD performed the surgery and helped in correction of the manuscript. All authors have read, approved and contributed towards the manuscript.

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