

Gynaecological causes of abdominal pain

Samantha Body
Christian Phillips

Abstract

Abdominal pain is a common presentation both in the acute and outpatient setting. It poses a diagnostic challenge as differential diagnosis can be exhaustive. This article aims to cover differences in history, examination and investigations when considering gynaecological reasons for abdominal pain and the common causes of pain in both pregnancy and the non-pregnant female, which will be useful to a surgical trainee.

Keywords Abdominal pain; ectopic pregnancy; endometriosis; gynaecology; ovarian cyst; pelvic inflammatory disease

Introduction

Abdominal pain presents a diagnostic challenge with a range of pathologies that often overlap in presentation. Gynaecological causes of abdominal pain include pathologies ranging from self-limiting conditions requiring minimal intervention to life threatening conditions, in both the pregnant and non-pregnant female. Accurate and prompt diagnosis is critical and often challenging and is initially based on history and examination.

History

As with all history-taking skills, a systematic approach is important. Abdominal pain caused by the reproductive tract is usually located in the lower abdomen and pelvis. It is important to discover more about the nature of the pain, including whether the history is acute or chronic or the onset is gradual or sudden, suggesting rupture of an ovarian cyst. Unilateral location of the pain with radiation to the lower back is possible with ovarian cysts, as opposed to bilateral lower abdominal pain caused by pelvic inflammatory disease.

Determining whether the pain is cyclical or non-cyclical in pattern can help identify endometriosis, which worsens at the time of menstruation or just prior to it, and lasts throughout menstruation. Unusual vaginal bleeding or purulent discharge with a history of post-coital bleeding may suggest pelvic inflammatory disease. The date of the last menstrual period should be determined and whether the patient is pregnant and if so, the dates of the positive urinary pregnancy test.

Samantha Body MBChB Hons MRCS is a General Surgical Registrar in the Wessex Deanery, UK. Conflicts of interest: none declared.

Christian Phillips BM BSc Hons DFFP DM MRCOG is Clinical Lead and Consultant Gynaecologist at Hampshire Hospitals, Basingstoke and Visiting Professor at the University of Winchester, UK. Conflicts of interest: none declared.

Obtaining a sexual history is important in determining the possibility of pelvic inflammatory disease and whether dyspareunia (pain during sex) is reported which can be experienced with ovarian tumours and pelvic inflammatory disease. Pressure effects on the bladder and vascular supply from pelvic masses can also cause symptoms of urinary frequency, leg swelling and varicose veins.

Nausea and vomiting is seen in majority of patients (85%) with ovarian torsion¹ and at least half of patients with pelvic inflammatory disease.² Bloating, lethargy and constipation can be seen in endometriosis which has been known to cause rectal bleeding and painful defecation.

Examination

Continuing with a systematic approach, a full assessment including haemodynamic stability will identify whether the patient in shock has been the result of haemorrhage, ectopic pregnancy or rupture of large ovarian cysts. Determining whether the patient is febrile and has a tachycardia will also aid diagnosis.

Examining the abdomen determines whether there are any signs of peritonitis present, the location of the pain, and whether ascites is apparent and if any masses are palpable. A palpable mass from the reproductive tract will arise from the pelvis and it will therefore be impossible to palpate below the mass, which will not disappear after urination and will be dull to percussion. Bilateral palpable masses that are fixed and tender may be tubo-ovarian abscesses or endometriomas.

In addition to abdominal examination, a bimanual vaginal examination is mandatory. Adnexal tenderness, cervical excitation and pelvic masses can be felt on vaginal examination. The presence of cervical excitation can help differentiate pelvic inflammatory disease from appendicitis.

The examination is completed by inspecting for pressure effects of a large pelvic mass with varicose veins and leg swelling.

Investigations

Once a provisional diagnosis is obtained, biochemical and radiological investigations can be crucial in confirming the diagnosis. The most useful investigations for gynaecological causes of abdominal pain are a pregnancy test and ultrasonography. A urinary pregnancy test should be performed on admission as every woman of reproductive age should be assumed to be pregnant until proven otherwise. Ultrasound is typically the first-line modality used to assess the pelvis and is safe and readily available. It is, however, highly user dependent and restricted by large body habitus. This can be improved by a transvaginal ultrasound which has improved access to the pelvic organs. Computed tomography (CT) is accurate, reproducible, widely available and quick to obtain. The limitations of CT include contrast induced nephropathy, ionizing radiation and it is contraindicated in pregnancy.

Magnetic resonance imaging (MRI) can be very useful in assessing pelvic organs and differentiation of soft tissue, with no ionizing radiation and is the second line modality for use in pregnancy after ultrasound. It is however, limited in availability, prone to artefact and usually takes longer to perform.

Diagnostic laparoscopy is considered in patients with acute abdominal pain when diagnosis is not clear after less invasive investigations. This is usually considered when the differentials include appendicitis, pelvic inflammatory disease or ovarian torsion. If during diagnostic laparoscopy, a gynaecological condition is discovered this should prompt involvement of a gynaecologist.

Differentials

Gynaecological causes of abdominal pain can be classified into pregnancy-related causes and non-pregnancy related causes of pain. Acute pelvic inflammatory disease and complications of ovarian cysts are the most common gynaecological causes of non-pregnancy related abdominal pain.

Pregnancy

In pregnancy, acute abdominal pain should be approached in the same way as for a non-pregnant female. When presenting with an acute abdomen or evidence of shock, an ectopic pregnancy should be assumed until proven otherwise. Patients who are unaware they are pregnant or are in the first trimester can present to the general surgeon; however, in later pregnancy, abdominal pain should primarily be investigated by the obstetrician and involve the general surgeon when required. Physiological changes related to pregnancy should be considered when assessing pregnant women with abdominal pain, particularly the increase in the normal range for white cell count to $10\text{--}14 \times 10^9$ cells/l. The enlarged uterus extends out of the pelvis and into the abdominal cavity at 12 weeks gestation, which can cause diagnostic confusion later in pregnancy as it can affect the normal location of pelvic and abdominal organs and mask peritoneal signs.³

Ectopic pregnancy

An ectopic pregnancy is defined as products of conception implanting outside of the uterine cavity, most commonly in the fallopian tube. Due to the life-threatening nature of rupture and haemorrhage, ectopic pregnancy must be ruled out when a woman of reproductive age presents with abdominal or pelvic pain. Pregnancy tests are very sensitive and therefore if they are negative, ongoing pregnancy is excluded. If positive, however, ectopic pregnancy needs to be investigated. Clinical features of ectopic pregnancy can range from no signs or symptoms in an unruptured ectopic pregnancy to a presentation of a shocked state due to intraperitoneal haemorrhage with a rupture, with signs of shock and peritonism. Presentation is usually 6–8 weeks after the last menstrual period.

Risk factors include fallopian tube scarring from previous ectopic pregnancies or a history of pelvic inflammatory disease and presence of an intrauterine contraceptive device. An ultrasound should be performed in any patient presenting with abdominal pain and a positive pregnancy test to confirm the presence of an intrauterine pregnancy. Ultrasound cannot reliably determine intrauterine pregnancy before 6 weeks. In these cases, serial human chorionic gonadotrophin levels are measured to confirm that the level doubles in 48 hours, as is expected with an intrauterine pregnancy (IUP). Even this can be unreliable and

patients should be advised to have a chaperone at all times as ectopic pregnancy can not be excluded until an IUP has been confirmed on USS.

Management

Treatment options for an unruptured ectopic pregnancy include salpingostomy and salpingectomy, which may be performed via laparoscopy or laparotomy. Methotrexate can be used for the treatment of an unruptured ectopic pregnancy if the ectopic meet certain criteria (Table 1).⁴ Ruptured ectopic pregnancy needs to be removed and this can be done by the laparoscopic route in experienced hands, otherwise laparotomy is required.

Other pregnancy-related causes of abdominal pain early in pregnancy include unilateral, mild pelvic pain due to stretching of the round ligament and threatened miscarriage, although the latter does not usually present to the general surgeon as it is often accompanied by vaginal bleeding. Ovarian cysts are not uncommon in pregnancy. Corpus luteal cysts can increase in size or haemorrhage. Management is conservative and requires observation unless torsion is suspected.

Fibroids (leiomyomas)

Uterine leiomyomas are benign tumours arising from the myometrium. They occur in women of reproductive age with increasing prevalence as age increases. Leiomyomas have not been described in pre-pubertal girls and most will shrink after menopause.^{5,6} Fibroids may be intramural, submucous, subserous or pedunculated (Figure 1). The presentation usually involves menorrhagia. Pain is rare and is often not acute unless degeneration or torsion occurs. Associated symptoms are related to bulk and pressure effects. Degeneration may occur during pregnancy due to compromised blood supply to meet the increasing demand of the enlarging uterus. Symptoms of degeneration of fibroids include localized unilateral abdominal pain associated with fever, nausea, vomiting and peritoneal

NICE guidance for management of ectopic pregnancy

Methotrexate for first-line treatment

No significant pain
Unruptured ectopic pregnancy with adnexal mass <35 mm with no visible heart beat
Serum hCG level <1500 IU/litre
No intrauterine pregnancy (confirmed on USS)

Surgery for first-line treatment

Unable to return for follow up after methotrexate treatment
Ectopic pregnancy and significant pain
Ectopic pregnancy with adnexal mass of 35 mm or larger
Ectopic pregnancy with foetal heartbeat visible on an ultrasound scan
Ectopic pregnancy and a serum hCG level of 5000 IU/litre or more

Treatment can be with either methotrexate or surgical management if the serum hCG level is between 1500 IU/litre to 5000 IU/litre. Women treated with methotrexate require two serum hCG levels in the first week then weekly levels until negative hCG level.

Table 1

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