

# Complications in early pregnancy

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## Abstract

The pregnant woman presents a diagnostic challenge as physiological, anatomical and biochemical changes of pregnancy may mask symptoms and signs, as well as the pregnancy itself being the source of the problem. The pathologies occurring in early pregnancy are common but some may be life threatening and it is therefore essential to promptly diagnose and treat complications to achieve the best fetal and maternal outcomes. This review considers the common clinical problems that occur in early pregnancy, including the common clinical and diagnostic features of obstetric and non-obstetric related causes, treatment methodologies and implications.

**Keywords** early pregnancy; ectopic pregnancy; first trimester; hyperemesis gravidarum; miscarriage; molar pregnancy; ovarian cyst rupture

## Introduction

The symptoms and signs that women present with in early pregnancy (i.e. in the first trimester) are often non-specific, commonly including tiredness, headache, abdominal pain, urinary symptoms and nausea and vomiting. A systematic approach should be employed, similar to that of the non-pregnant patient, with history, examination, and appropriate investigations. Abdominal pain in early pregnancy is a common symptom, with both obstetric and non-obstetric causes, and whilst the vast majority of women do not have any significant intra-abdominal pathology (40–50% have no identifiable cause), a number of life threatening complications can occur. These may present with an 'acute abdomen', a rapid onset of severe symptoms including abdominal pain and muscle rigidity for which consideration of emergency surgery is vital. Timely diagnosis and appropriate treatment is therefore essential for improving maternal and perinatal outcomes.

Physiological, anatomical and biochemical alterations occur through each trimester of pregnancy. Approximately 80% of women will experience nausea and vomiting during normal early pregnancy, therefore confusing clinical presentation.

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Anatomically, as the uterus enlarges, the appendix may shift upwards and laterally which can render McBurney's point diagnostically futile. Peritoneal signs such as guarding may also be absent. The stretching of ligaments and muscles supporting the enlarging uterus may produce abdominal pain. A physiological leucocytosis and raised amylase and alkaline phosphatase may also occur, as well as a reduced haemocrit due to the dilutional effect of plasma expansion. Imaging options in pregnancy remain limited due to the risk of teratogenicity from ionising radiation, although exposures of less than 0.05 Gy have not been associated with pregnancy loss or fetal malformations. Ultrasound remains the primary imaging modality of choice, followed by MRI and CT to avoid exposing the fetus to irradiation.

Table 1 outlines the common conditions in early pregnancy and the key areas covered in this article. Rarer causes include intestinal obstruction, aortic dissection or rupture, and sickle cell crisis in patients with active sickle cell disease.

## Pregnancy-related complications

### Ectopic pregnancy

Ectopic pregnancy is derived from the Greek work "ektopos" meaning out of place and is defined as the implantation of a fertilised egg anywhere outside the uterine cavity, most commonly in the fallopian tubes (95%); however, rarer 'non-tubal ectopics' can also implant cervically, in Caesarean section scars, in ovaries, and abdominally. Ectopic pregnancy remains the leading cause of early pregnancy maternal mortality in the UK, with two thirds of these deaths attributed to atypical presentation and delayed diagnosis. Risk factors for ectopic pregnancies include increased maternal age, previous pelvic infection or surgery, infertility, assisted conception and smoking.

Typically, patients present between 5 and 9 weeks gestation with a positive pregnancy test, vaginal bleeding (usually spotting) and pelvic pain (usually unilateral). They may however be asymptomatic, present with shoulder tip pain secondary to diaphragm irritation, in haemodynamic shock, or with gastrointestinal (particularly diarrhoea) or urinary symptoms. Particularly highlighted in the most recent triennial report into maternal deaths were patients presenting with atypical symptoms including diarrhoea, dizziness and vomiting and problems with diagnosis in women whose first language was not English. It is therefore essential to have a high degree of suspicion while reviewing patients to obtain an early diagnosis.

### Common problems in early pregnancy

Pregnancy-related causes	Gynaecological causes	Other causes
Ectopic pregnancy	Adnexal masses ovarian cyst rupture and torsion	Appendicitis
Miscarriage	Urinary tract infections	Gastroenteritis
Molar pregnancy		Acute pancreatitis
Hyperemesis gravidarum		Peptic ulcer disease
		Cholecystitis

Table 1

Examination may reveal pelvic, abdominal or cervical motion tenderness. Key first line investigations include transvaginal ultrasound (TVUSS) scanning and serum concentrations of human chorionic gonadotrophin (hCG). Serial serum hCG levels denote the degree of trophoblastic proliferation and in a normal pregnancy, double every 48–72 hours, whereas ectopic pregnancies produce lower concentrations of hCG. Over 90% of ectopic pregnancies should be visualised on TVUSS beyond a gestational age of 6 weeks and 6 days.

Treatment options for an ectopic pregnancy are expectant, medical and surgical management and will depend on the clinical status of the patient as well as her informed choice. Expectant management involves no intervention and allows the pregnancy to resolve spontaneously while medical management involves administration of intramuscular methotrexate. Both may be considered in stable women but patients require regular follow up to ensure that serum hCG levels are reducing, and the ectopic remains at risk of rupture until it resolves completely. If the woman is haemodynamically unstable, in severe pain or a live fetal pole and fetal heartbeat is seen within the ectopic pregnancy, surgical intervention is indicated. This most commonly involves laparoscopic removal of the affected fallopian tube, where there is no contralateral tubal disease.

The most common concern from patients is of future fertility and studies suggest spontaneous conception rates following an ectopic pregnancy is between 38 and 89%. Reported recurrent rates of ectopic pregnancies are between 6 and 18% independent of the treatment type.

### Miscarriage (Table 2)

Miscarriage is defined as the loss of a pregnancy at any time up to the 24th week and occurs in 20% of all women with a positive pregnancy test. The majority occur in the first trimester and whilst little is known about the aetiology, chromosomal abnormalities are thought to play a key role. Maternal age is the single biggest predictor of miscarriage (11% at 21–25 years, 60% 41–45 years).

Common presentations include lower abdominal pain and vaginal bleeding. Miscarriage is diagnosed by a combination of the patient's history, examination findings, TVUSS and serum hCG and progesterone. Patients may require more than one scan if no intrauterine or extra uterine pregnancy is initially identified. Once miscarriage is confirmed patients can be managed expectantly, medically or surgically. Conservative management may be considered in all cases for 7–14 days as the first line strategy unless the patient is haemodynamically unstable or the method is unacceptable to the patient. This involves no intervention and the patient does not need routine follow up. Medical management using oral misoprostol (a prostaglandin) can be offered if expectant or surgical management is not acceptable to the patient. For both expectant and medical management, women should be counselled regarding what to expect (pain and bleeding or resolution of symptoms) and told to return if their bleeding does not settle in 2 weeks or if they have not bled in this period of time. Women should take a pregnancy test 3 weeks post treatment and return for assessment if positive.

Surgical management involves passing a suction cannula into the uterus and removing the products of conception. This can be performed in theatre under general anaesthetic;

### WHO classification of the stages of spontaneous miscarriage

Threatened miscarriage	A threat of miscarriage that exists when unprovoked vaginal bleeding, with or without lower abdominal pain, occurs in a pregnancy of <22 weeks' gestation (pregnancy may continue).
Inevitable miscarriage	A miscarriage deemed inevitable when specific clinical features indicate that a pregnancy is in the process of physiological expulsion from within the uterine cavity (pregnancy will not continue and will proceed to incomplete or complete miscarriage).
Incomplete miscarriage	A miscarriage in which early pregnancy tissue is partially expelled. It is possible that many incomplete miscarriages are unrecognised missed miscarriages.
Complete miscarriage	A miscarriage in which early pregnancy tissue is completely expelled.
Missed miscarriage	A miscarriage with ultrasound features consistent with a non-viable or non-continuing pregnancy, even in the absence of clinical features. Early pregnancy tissue may be partially expelled. Missed miscarriage is usually an incidental finding because there is rarely any indication that anything was wrong with the pregnancy. Some women do recall a transient and/or brownish vaginal discharge, or a vague reduction in symptoms of early pregnancy.

**Table 2**

alternatively, for a select group of patients, manual vacuum aspiration under local anaesthetic can be performed in an outpatient setting.

Women should be reassured that they have not done anything to cause the miscarriage and that future pregnancies will not be affected. Maternal investigations are not advised until three consecutive miscarriages have occurred and a diagnosis of recurrent miscarriage has been made.

### Gestational trophoblastic disease GTD (molar pregnancy)

Although rare (0.57–1.1 per 1000 pregnancies), gestational trophoblastic disease (GTD) is an important diagnosis to consider. GTD includes a spectrum of interrelated tumours including complete and partial hydatidiform mole, invasive mole, choriocarcinoma, and placental site trophoblastic tumour, which are diagnosed definitively using histology. All forms originate from the placental trophoblast with different propensities for local invasion and spread.

The most common form of GTD is the hydatidiform mole or molar pregnancy of which there are two types: complete and partial. A complete molar pregnancy is diploid, and contain only paternally derived genes. There is no embryo and an abnormal placenta. Partial moles are usually triploid in origin, with an extra set of paternally derived chromosomes. In a partial molar pregnancy there is an abnormally large placenta and some fetal development may occur.

The main risk factors for molar pregnancy include advanced or very young maternal age and a history of previous molar pregnancy. The majority of molar pregnancies present as first

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