

# Uterine rupture

Complete uterine rupture in pregnancy is a catastrophic event where a full-thickness tear develops, opening the uterus directly into the abdominal cavity. It requires rapid surgical attention to safeguard maternal and infant outcomes.

Most occur during labour; however, uterine scars following earlier caesarean may rupture during the third trimester before any contractions occur.

## Classification

- Occult or incomplete rupture refers to a surgical scar separating but the visceral peritoneum staying intact. It is usually asymptomatic and does not require emergency surgery.
- Complete rupture can be:
  - **Traumatic:**
    - A road traffic collision.
    - Incorrect use of oxytocic agent.
    - A poorly conducted attempt at [operative vaginal delivery](#) (typically [breech](#) extraction with an incompletely dilated cervix).
    - (Operative hysteroscopy in the non-pregnant woman).

- **Spontaneous:**
  - Most patients have either had a [caesarean section](#) or a history of trauma that could have caused permanent damage<sup>[1]</sup>.
  - Patients may have no history of surgery but a weakened uterus due to multiparity, particularly if they have an old lateral cervical laceration.

## Epidemiology

### Incidence

Uterine rupture occurs extremely rarely – according to one study from the Netherlands, the incidence is between 0.7 and 5.1 per 10,000 deliveries in unscarred and scarred uteri, respectively<sup>[2]</sup>. Following a previous caesarean section the incidence increases to 22–74/10,000 deliveries if vaginal birth after caesarean (VBAC) is attempted.

In a World Health Organization (WHO) systematic review of uterine rupture worldwide, the median incidence was 5.3 per 10,000 births<sup>[3]</sup>. If only high-income countries are taken into consideration, the mean incidence was around 3 per 10,000 deliveries.

### Risk factors<sup>[4]</sup>

- 87% of cases occur in women who have had a previous caesarean section:
  - Classical vertical and T-shaped incisions carry a higher risk of later uterine rupture than the standard modern low transverse approach.
  - An inter-delivery interval of less than 18–24 months increases the risk<sup>[5]</sup>.
  - The risk appears to be higher in pregnancies of gestational age greater than 40 weeks.
- Prior uterine surgery (including myomectomy, curettage, induced abortion, [manual removal of the placenta](#)). In 11.5% of cases there is no known uterine scar.
- Uterine anomalies – eg, undeveloped uterine horn.

- Trauma – eg, traffic collision.
- Use of rotational forceps.
- Obstructed labour.
- [Induction of labour](#) – prostaglandins should be used with caution during a trial of labour.
- Cervical laceration.
- Medically induced termination after 16 weeks of gestation.
- [Placenta percreta or increta](#).
- Hydramnios.
- Macrosomia and fetal anomaly – eg, hydrocephalus.
- Malpresentation (brow or face).
- [Multiple pregnancy](#).
- Choriocarcinoma.

Other procedures with high risk of uterine rupture include internal podalic version and extraction, destructive operations and manoeuvres to relieve [shoulder dystocia](#).

## Presentation

Management of uterine rupture depends on prompt detection and diagnosis. The classic signs (sudden tearing uterine pain, vaginal haemorrhage, cessation of uterine contractions, regression of the fetus) have been shown to be unreliable and frequently absent but any of the following should alert suspicion:

- Cardiotocograph (CTG) abnormalities, especially fetal bradycardia<sup>[5]</sup>.
- Severe abdominal pain changing so that it persists between contractions.
- Chest or shoulder tip pain and sudden shortness of breath.
- Scar pain and tenderness.

- Abnormal vaginal bleeding or gross haematuria.
- Cessation of previously efficient uterine contractions.
- Maternal tachycardia, hypotension or shock.
- Movement away of the presenting part. Abdominal palpation may reveal obvious fetal parts as the fetus passes either partially or totally out of the uterus and into the abdominal cavity, with a high risk of intrapartum death.

If there is suspicion of uterine rupture, laparotomy may still be required even after a successful vaginal delivery, to assess damage and to control bleeding.

## Investigations

- Ultrasound can be used to diagnose rupture prior to labour when it may show an abnormal fetal position, haemoperitoneum or absent or thin uterine wall. Ultrasound is being analysed as a tool to predict uterine rupture. A French study suggests that a uterine wall thickness of greater than 4.5 mm has negative predictive value of 100% but unfortunately the positive predictive value of thickness less than 3.5 mm is poor at only 11.8%<sup>[5]</sup>.
- Intrauterine pressure catheters are sometimes used but may fail to show loss of uterine tone or contractile patterns following uterine rupture.

## Management

The initial management is the same as for other causes of acute fetal distress - **urgent** surgical delivery.

- Resuscitation as necessary.
- Uterine repair if possible; hysterectomy may be indicated if haemorrhage persists - either total or sub-total, depending on the site of rupture and the patient's condition.

- There is no firm evidence regarding which type of thread, knotting or sequence of suturing is more favorable to reduce the risk of uterine rupture after VBAC or hysterotomy after myomectomy<sup>[6]</sup>.
- In cases of lateral rupture involving lower uterine segment and uterine artery where haemorrhage and haematoma obscure the operative field, ligation of the ipsilateral hypogastric artery to stop bleeding may be needed.
- If a uterine repair has been achieved it is important to note that repeat rupture occurs in approximately 20% of cases.

In all cases of operative delivery, especially where there are risk factors for uterine rupture, a thorough examination of the uterus and birth canal is required.

## Complications

- Postoperative infection.
- Damage to ureter.
- [Amniotic fluid embolism](#).
- Massive maternal haemorrhage and [disseminated intravascular coagulation \(DIC\)](#).
- [Pituitary failure](#).

## Prognosis<sup>[5]</sup>

- 6.2% of uterine ruptures are associated with perinatal (infant) death.
- 14–33% of women with uterine rupture require an emergency hysterectomy.
- In a Dutch nationwide study there were no pregnancy-related maternal deaths due to uterine rupture, but the perinatal (fetal) death occurred in 8.7%<sup>[2]</sup>.

## Prevention

Unfortunately, uterine rupture cannot be adequately predicted for women wanting a trial of labour following a previous caesarean section [7]. Doctors should review the medical history for risk factors and counsel regarding her relative risks, benefits, alternatives and probability of success. Women should be informed that planned VBAC is associated with an approximately 1 in 200 (0.5%) risk of uterine rupture [8].

Usually, shared care undertaken with an obstetrician is appropriate for any woman with a previous caesarean section.

A few circumstances (prior classic or T-shaped incision and unavailability of facilities for emergency caesarean delivery) will preclude a trial of labour. In most instances, however, National Institute for Health and Care Excellence (NICE) guidance advises that the decision about mode of birth following a previous caesarean should take into consideration [9]:

- Maternal preferences and priorities.
- A general discussion of overall risks and benefits of repeat caesarean section versus VBAC, including the risk of an unplanned caesarean section.
- The risk of uterine rupture for all women with prior caesarean is 3 per 1,000. The risk with a trial of labour is 4.7/1,000 and if there is an elective repeat caesarean the rate is 0.26 per 1,000 [5].
- Women who have had up to four caesarean deliveries should be advised that although the risk of uterine rupture is higher for trial of VBAC, it is still rare. The rate of uterine rupture is no higher in women who have had more than one caesarean than it is in women who have only had one, although the hysterectomy rate and need for transfusion are greater [10].
- 6% of uterine ruptures are associated with perinatal death. The risk of an intrapartum death is small in planned VBAC (10 per 10,000) but higher than those having a planned repeat caesarean (1 per 10,000). The effect of planned vaginal birth or repeat caesarean section on cerebral palsy is uncertain.

- Women who have had a previous caesarean section but also a vaginal birth can be advised that they are more likely to achieve a vaginal birth than women who have only had a caesarean birth.

Those who opt for a trial of labour should be offered [continuous electronic fetal monitoring](#) during delivery and care during labour in a unit where there is immediate access to emergency caesareans and an on-site blood transfusion service<sup>[11]</sup>.

## Induction of labour<sup>[12]</sup>

- NICE guidance states that women with a previous caesarean section can be offered induction of labour but that they should be aware that the risk of uterine rupture is increased two- to three-fold, and the risk of needing an emergency caesarean is around 1.5-fold higher<sup>[8]</sup>.
- When a planned VBAC is induced, the uterine rupture risk is higher if prostaglandin is used than in a non-prostaglandin-based regimen: in a Norwegian observational study of almost 19,000 women, the risk was 12.6 times higher after a prostaglandin induction than if the induction was mechanical or the labour spontaneous<sup>[13]</sup>.
- When a planned VBAC is augmented, the oxytocin dose should be titrated such that contraction frequency is no more than 4 in 10 minutes. Research supports a maximum oxytocin dose of 20 mU/minute in trials of labour, to avoid an unacceptably high (4 x greater) risk of uterine rupture<sup>[14]</sup>.
- Decisions regarding induction and augmentation of a planned VBAC should be made by the woman and a consultant obstetrician.

### Editor's note

[Dr Sarah Jarvis](#), 12th April 2021

No content relevant to this clinical article has been affected by any new or updated recommendation from a new guideline from the National Institute for Health and Care Excellence (NICE) on caesarean birth<sup>[15]</sup>.

**Disclaimer:** This article is for information only and should not be used for the diagnosis or treatment of medical conditions. Egton Medical Information Systems Limited has used all reasonable care in compiling the information but makes no warranty as to its accuracy. Consult a doctor or other healthcare professional for diagnosis and treatment of medical conditions. For details see our [conditions](#).

Authored by:	Peer Reviewed by: Dr Colin Tidy, MRCGP	
Originally Published: 20/11/2023	Next review date: 20/03/2020	Document ID: doc_742

---

View this article online at: [patient.info/doctor/uterine-rupture](http://patient.info/doctor/uterine-rupture)

Discuss Uterine rupture and find more trusted resources at [Patient](#).

---



To find out more visit [www.patientaccess.com](http://www.patientaccess.com)  
or download the app



Follow us

