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Case Report

Forensic insight into sudden maternal death from spontaneous uterine rupture in the third trimester: an autopsy-based case report

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ABSTRACT

Spontaneous rupture of the uterus remains a severe obstetric complication in many developing nations, posing a significant threat to both maternal and fetal outcomes. In India, it continues to contribute to approximately 5-10% of maternal deaths, primarily due to the high incidence of unregistered or emergency pregnancies, particularly among women from rural regions with limited access to antenatal care. While rupture of a previously scarred uterus is more commonly reported, spontaneous rupture of an unscarred uterus is an uncommon occurrence. Identified risk factors for such ruptures include grand multiparity, abnormal placentation, and congenital uterine malformations. We are reporting an autopsy-based case of sudden, unexplained death of a 40-year-old full-term pregnant lady, who was G7P6L6, with all previous normal deliveries, in which multiparity was the predisposing factor of spontaneous uterine rupture.

Keywords: Spontaneous 3rd trimester uterine rupture, Unscarred uterus, Intrapartum maternal mortality, Grand multiparity, Obstetric emergency, Autopsy

INTRODUCTION

Uterine rupture is one of the most dangerous complications encountered in obstetric emergencies. In the Indian context, it remains a significant cause of maternal mortality, contributing to approximately 5-10% of maternal deaths.[1] The condition poses an even greater risk to fetal survival compared to maternal outcomes.[2] When rupture occurs in an unscarred uterus—a rare but critical event—the prognosis for both mother and foetus is typically poorer.[3] Perinatal deaths following uterine rupture are distressingly common, with mortality rates reported as high as 80% to 95%. Overall incidence of uterine rupture in scarred uterus, with reported cases is 22 in 10,000 deliveries, and in an unscarred uterus, it is rare, with an estimated incidence of about 0.2 per 10,000 deliveries.[4] In low-resource settings, the condition is seen more often, mainly because many pregnant women, especially in rural areas, do not receive regular antenatal care and usually present late with obstetric emergencies. With the rising number of caesarean sections performed in tertiary and teaching hospitals, most cases of uterine rupture observed in these settings involve a previously scarred uterus.[1-5] By contrast, rupture of an unscarred uterus is exceedingly uncommon. Spontaneous rupture of the uterus in a first pregnancy is considered extremely rare, with the primigravid uterus traditionally viewed as resistant to such events.[6] In the available literature, the rate of complete uterine rupture has increased in recent years among women with and without previous caesarean sections, mainly due to the more frequent use of labour induction and augmentation.[7] In women without prior caesarean delivery, induction methods include prostaglandins, oxytocin, amniotomy, and mechanical

techniques such as transcervical balloon catheters. The rupture of an unscarred uterus is of two types, which include traumatic or spontaneous. Traumatic causes include abdominal injury, labour induction, particularly with oxytocin or prostaglandins, and procedures such as internal podalic version, assisted breech, or instrumental delivery.[8,9] Spontaneous rupture is associated with cephalopelvic disproportion, fetal malpresentation, macrosomia, and uterine anomalies like a bicornuate or unicornuate uterus. It may also occur in grand multiparas, cases of abnormal placentation, or following invasive molar pregnancy. These cases are often subtle in onset, with a lack of apparent symptoms on presentation, which can cause misdiagnosis or delayed diagnosis. Early and accurate detection, followed by timely medical intervention, minimises morbidity and mortality in such conditions. In this study, we review and report a case of the sudden, unexplained death of a 40-year-old full-term pregnant lady, who was G7P6L6, with all previous normal deliveries. She had a history of abdominal pain and bleeding per vaginum. She was also not registered with any healthcare centre for antenatal check-ups or investigations. Also aim of the study was to review the literature.

CASE REPORT

A 40-year-old female was referred from the district (secondary care) healthcare centre and brought to the emergency department of gynaecology in a tertiary care hospital with complaints of abdominal pain, bleeding and meconium stains present per vagina.

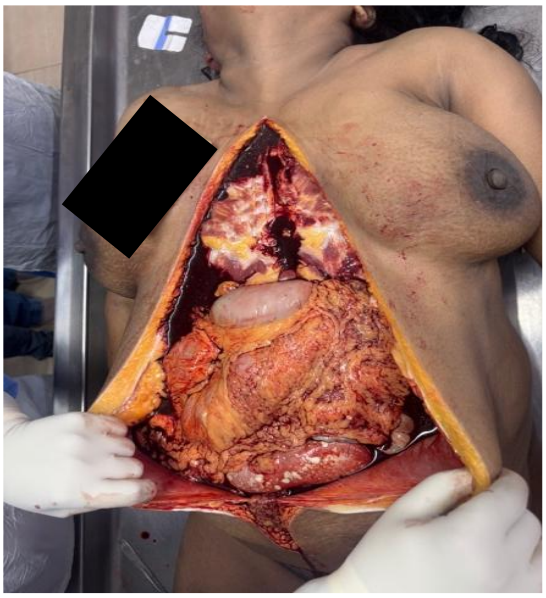

Figure 1: Abdominal cavity filled with blood mixed with blood and a free-floating dead foetus attached to the umbilical cord.

She was declared dead on arrival, and the body was shifted to the mortuary for a medicolegal autopsy. History from the family members revealed that she was three times married and had six children, from her previous two marriages; all of them were normal vaginal deliveries.

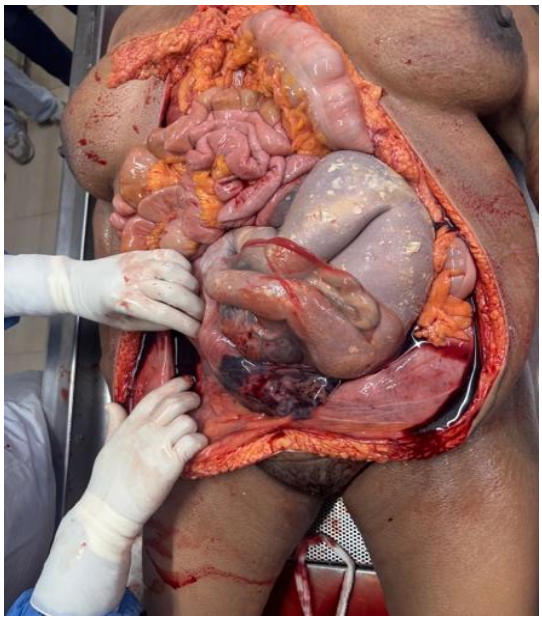

Figure 2: Floating foetus through ruptured site with head stuck inside the uterus.

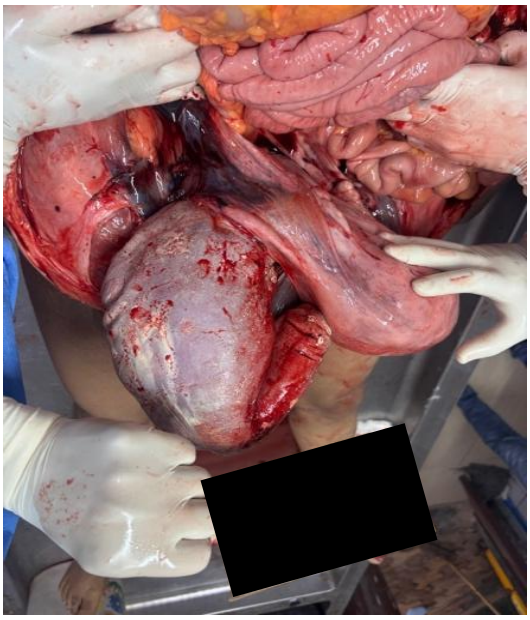

Figure 3: Complete ruptured sites on the anterior aspect of the uterus through which the amniotic membrane had also come out.

The duration gap between the last pregnancies was very frequent, as per the history. She was a homemaker and was now 38+ weeks pregnant from her third marriage. No antenatal check-ups or medical history/records were available, suggesting that she did not consult any doctor throughout her pregnancy. On autopsy, external examination revealed irregular distention of the abdomen and right lower limb oedema. Cyanosis of the lips and nail

beds of both hands was present. On the opening of the peritoneal cavity, around 3 litres of frank blood mixed with amniotic fluid and a free-floating dead body of foetus attached to the umbilical cord were seen; most of the placenta and the amniotic membrane were seen outside the uterine cavity, the head of the foetus was engaged in the pelvic inlet and the uterine cavity (Figure 1). After clearing the blood-mixed fluids from the abdominal cavity, uterus was enlarged, contracted and was appearing post-partum like of uterus with adnexa and foetus was examined; it showed a haemorrhagic lower uterine segment, uterus measured 20×15×6 cm and weighed 1.524 kilograms with two distinct through and through ruptures present at the anterior and left lateral wall of the uterus at the level of the isthmus, with irregular, blood infiltrated margins along with the ruptured uterine blood vessels, measuring 11×9 cm in size through which the body of foetus along with an umbilical cord, part of the placenta and amniotic membrane had come out (Figure 2). The neck of the foetus was seen engaged in a ruptured site (Figure 2). The head of the foetus was engaged in the pelvic inlet. Other through-and-through ruptured sites were identified on the anterior aspect of the uterus, measuring 7cm x 4cm, and were located below the level of placental attachment through which the amniotic membrane had come out (Figure 3). On further exploration, the placenta was separated from the uterine area, and only a part of the membrane was attached to the endometrial wall. The cervix was haemorrhagic and 7 cm dilated. On the opening of the uterus, the endometrial wall showed a post-partum endometrial wall (Figure 4).

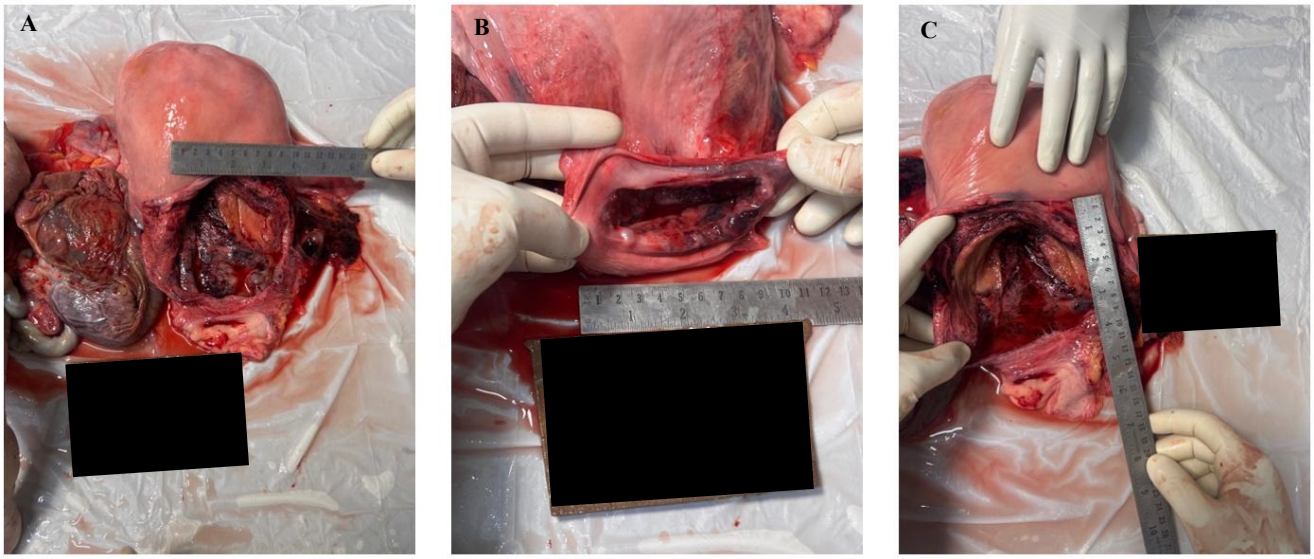

Figure 4 (A-C): The cervix was haemorrhagic and dilated to a length of 7 cm. The uterine endometrial wall showed a post-partum endometrial wall.

Figure 5 (A and B): Term-sized foetus.

All internal organs were slightly pale, and no other abnormality was observed. The cause of death given in this case was shock and haemorrhage secondary to spontaneous rupture of the uterus during labour. A single, dead male foetus weighs 3.100 kg, has a length of 50 cm, and has a head circumference of 34 cm. Scalp hair was black in colour and had a length of 3-4 cm, and was covered with vernix caseosa (Figure 5). The skin was covered with vernix caseosa in places. Nails extending to the fingertips and testes were present in the scrotum. The umbilical cord measured 65 cm in length, and the centre of ossification was present at the sternum, the lower end of the femur, the calcaneum and the talus.

DISCUSSION

Uterine rupture during pregnancy or labour is uncommon but poses a serious threat to both mother and foetus. It may occur in an unscarred uterus or one with a previous surgical scar. Anatomically, uterine rupture is classified as either complete or incomplete, in which the complete rupture involves full-thickness tearing of the uterine wall, along with the overlying serosa.[10] Complete uterine rupture is considered more severe than incomplete rupture, as it results in a direct opening between the uterine and peritoneal cavities often leading to the displacement of foetal or placental tissues into the abdominal cavity.[11] It typically presents abruptly and is frequently accompanied by intense abdominal pain and clinical signs of substantial haemorrhage. Research suggests that the left lateral wall of the uterus is more susceptible to rupture than the right lateral wall.[12,13] This may be due to venous congestion in the left broad ligament, linked to the perpendicular entry of the left ovarian vein into the renal vein. Additionally, uterine dextrorotation, seen in up to 80% of pregnancies, may further increase the risk on the left side.[14] Misra et al observed that spontaneous rupture of an unscarred uterus often occurs in the lower uterine segment, which is structurally the weakest.[15] When rupture involves the fundus, it typically happens before labour begins. Diagnosis in such cases may be delayed due to concealed bleeding, as blood accumulates within the peritoneal cavity. Other studies have similarly reported a higher incidence of rupture at the lower segment, likely due to thinning from muscle fibre elongation and distention.[11,16,17] Ofir et al also noted a greater tendency for cervical involvement in ruptures of unscarred uteri.[17]

A meta-analysis of 25 peer-reviewed studies (1976–2012) reported an overall incidence of pregnancy-related uterine rupture at 1 in 1,416 pregnancies (0.07%). Spontaneous rupture of an unscarred uterus occurred at a rate of 1 in 8,434 pregnancies (0.012%) in developed countries, compared to 1 in 920 pregnancies (0.11%) in developing nations.[18,19] Uterine rupture can occur even in the absence of a prior uterine scar or identifiable defect. Rupture of a normal, unscarred uterus is rare. However, the risk increases with factors such as grand multiparity, obstructed labour, malpresentation, breech extraction, and uterine instrumentation. A 10-year Irish study by Gardeil et al reported an incidence of 1 rupture per 30,764 deliveries (0.0033%) in unscarred uteri. No cases were seen among 21,998 primigravida's, and only two occurred among 39,529 multigravidas without prior uterine surgery.[8] Multiparity is widely recognized as a risk factor; Golan et al found that 31% of ruptures occurred in women with parity greater than five.[9] Schrinsky and Benson reported that 32% of unscarred uterine rupture cases occurred in women with a parity above four.[20] Similarly, Mokgokong et al found the average parity among such cases to be four.[21] Grand multiparity is a well-established risk factor for spontaneous rupture of an unscarred uterus, likely due to uterine muscle weakening from repeated pregnancies and deliveries.[17-19] Additional contributing factors include placental abnormalities and adenomyosis.[6] Although high parity is considered a risk factor for uterine rupture, Gardeil et al reported only two cases among 39,529 multigravidas without prior uterine scars (0.005%).[8]

In a study by Schrinsky et al, 22 cases of rupture occurred in an unscarred uterus, 86% during labour and 14% before its onset, contrasting with scarred uteri, where rupture was more evenly distributed between the antepartum and intrapartum periods.[20] Classic signs of uterine rupture in the third trimester include sudden, intense abdominal pain, cessation of contractions, vaginal bleeding, and maternal shock. Foetal distress is marked by bradycardia and reduced movements. Less common symptoms may involve epigastric or shoulder pain, abdominal distension, paralytic ileus, and hematuria.[22,23] However, these features are rarely identified before rupture, particularly in an unscarred uterus. The present case is particularly striking due to the occurrence of a complete, spontaneous rupture of an unscarred uterus in a grand multiparous woman with no history of uterine surgery or medical intervention. Autopsy revealed extensive hemoperitoneum with extrusion of the foetus, placenta, and membranes into the peritoneal cavity, along with multiple full-thickness ruptures involving the lower uterine segment and lateral wall, findings that unequivocally confirm dangerous intrapartum uterine failure. The post-partum–like contracted uterus, ruptured uterine vessels, and advanced cervical dilatation indicate that rupture occurred during active labour and progressed rapidly to hypovolemic shock and death before she could have reached to any medical attention. The absence of antenatal care, lack of early clinical recognition and delay in transportation primary or secondary healthcare centre to a higher medical centre underscore how uterine rupture in an unscarred uterus may present silently yet culminate in sudden maternal and foetal demise. Timely surgical management is crucial in cases of uterine rupture. The usual approach involves performing either a total or subtotal hysterectomy; however, uterine repair may be considered in women who wish to maintain fertility, particularly those who have not previously given birth. The recurrence rate in future pregnancies ranges from 4% to 19%.[24] To minimize risks,

elective caesarean section is recommended after confirming fetal lung maturity in women with a prior history of rupture.[24] Schrinsky et al reported maternal and foetal death rates of 20.8% and 64.6%, respectively, in cases of uterine rupture. Early recognition and rapid surgical intervention are critical for improving survival.[20] The time frame to successfully treat a complete uterine rupture before major foetal death occurs is very limited, ranging from 10 to 37 minutes.[25] This case emphasizes the critical role of medico-legal autopsy in establishing the cause of death in sudden obstetric fatalities. It highlights grand multiparity, unsupervised labour, and poor healthcare access as lethal but preventable risk factors.

Grand multiparity and unbooked pregnancies should be recognised as high-risk conditions at secondary-level healthcare facilities. Labouring women presenting with abdominal pain, vaginal bleeding, or fetal distress must be promptly evaluated for uterine rupture, even in the absence of a uterine scar. Unsupervised or prolonged labour should be avoided, and early referral with rapid transport to tertiary care centres is essential to prevent sudden maternal and fetal deaths. If uterine rupture is suspected, all efforts should be made immediately to organise the necessary surgical care, as prompt treatment is vital to improve outcomes for both mother and child. Because the situation can worsen quickly, healthcare providers must remain vigilant, especially with high-risk patients, and act promptly, even if uncertain about the diagnosis.

CONCLUSION

In our study, the absence of uterine scarring suggested that multiparity, as well as the patient's and the family's unawareness about frequent multiparity, were the primary contributing factors. The awareness regarding parity and the duration of the gap between the two pregnancies should be provided to society, also to reduce the burden of having multiple pregnancies after marriage. While most cases of uterine rupture occur in women with a prior uterine scar, commonly from caesarean sections, the most reliable early sign is sudden, prolonged fetal bradycardia. Strengthening antenatal registration and community awareness remains key to preventing preventable maternal deaths from uterine rupture. Timely surgery is vital to limit fetal injury, though adverse outcomes like hypoxia, acidosis, or neonatal complications may still occur despite prompt delivery.

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