ORIGINAL ARTICLE

An analysis of uterine rupture at the Nnamdi Azikiwe University Teaching Hospital Nnewi, Southeast Nigeria

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Abstract

Objective: Uterine rupture is a preventable condition which has persistently remained in our environment. The aim of this study therefore is to ascertain the incidence of uterine rupture, examine the predisposing factors and maternal and fetal outcome of patients managed of uterine rupture in a tertiary hospital.

Materials and Methods: This descriptive case series was conducted at the department of Obstetrics and Gynaecology, Nnamdi Azikiwe, University Teaching Hospital Nnewi from March 2004 to February 2009.

Results: The incidence of uterine rupture was 6.2 per 1000 deliveries. The commonest age range of occurrence was 30-34 years. Uterine rupture occurred predominantly among women of low parity. Previous caesarean section with concurrent use of oxytocics was the commonest risk factor documented.The maternal and perinatal mortality ratio was 94 per 100,000 deliveries and 6 per 1000 births respectively. Surgery was the main stay of treatment and the commonest procedure carried out was uterine repair only.

Conclusion: Rupture of the gravid uterus is still a significant cause of maternal mortality and morbidity in our environment. The causes are commonly preventable. The provision of maternal care by skilled personnel, proper antenatal care, update training programmes for health care providers and appropriate legislation on maternal care will significantly reduce the incidence of uterine rupture and improve its prognosis.

Key words: Maternal, morbidity, perinatal mortality, uterine rupture

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Introduction

Uterine rupture is a catastrophic obstetric complication associated with high rates of fetal and maternal morbidity and mortality.[1] This unfortunate event, although very rare in developed world, has remained a significant problem in developing nations. Uterine rupture usually occurs during labour but can also occur during pregnancy.[2,3] It has also been reported in all trimester of pregnancy[2,3]

Congenital uterine anomalies, fetopelvic disproportion, multiparity, previous myomectomy and caesarean scars, fetal macrosomia, labour induction or augumentation, neglected labour, abnormal lie and uterine instrumentation, are all predisposing factors to uterine rupture. Uterine rupture in primigravida with no identifiable risk factor has also been reported[2,4] The signs and symptoms of uterine rupture depend on the timing, site, and extent of uterine defect. The classical signs and symptoms of uterine rupture include fetal distress, loss of uterine contraction, abdominal pain, haemorrhage, recession of the presenting fetal part and shock. The initial signs and symptoms are however, non-specific, a condition that makes diagnosis difficult and sometimes delays definitive therapy. This delay in diagnosis and treatment often leads to adverse maternal and perinatal

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outcome. It is therefore important to maintain a high index of suspicion.

Prompt recognition of uterine rupture and expeditious recourse to laparotomy are critical in influencing perinatal as well as maternal morbidity and mortality. It has been postulated that from the time of diagnosis to delivery only 10-37 minutes are available before clinically significant fetal morbidity becomes inevitable due to catastrophic haemorrhage or fetal anoxia.[4,5] Uterine rupture contributes significantly to maternal morbidity and mortality and its associated perinatal mortality is noted to be very high.[6] This study is conducted to determine the prevalence of uterine rupture in scared and unscarred uteri, examine the predisposing factors, its' clinical features, associated morbidities and fetomaternal outcome of patients managed for uterine rupture in a tertiary hospital.

Materials and Methods

This is a retrospective study conducted at Nnamdi Azikiwe University Teaching Hospital, Nnewi, Anambra State Southeast Nigeria. The folder numbers of the women who were managed for ruptured uterus over a 5 year period (within March 2004-February 2009) was collected from the labour ward and obstetric operation theatre registers. Their case folders were retrieved from the medical records department for analysis. Using structured pattern, information on their sociodemographic factors, booking status, clinical features at presentation and the place of attempted vaginal delivery were extracted. Data on the mode of treatment, intraoperative findings, and associated complications were also collected. The collected data were analysed using SPSS version 15.0 for windows evaluation. Statistical comparison was done using chi square (X^2) and Fischer exact. The level of significance was accepted when the *P*-value is equal to or less than 0.05. Ethical approval was sought for and exempted from the hospital ethical committee. The results are presented in tables and chart.

Result

During the period under review 4021 consecutive deliveries were conducted in Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi. Out of this number of patients, 25 had uterine rupture. Thus the incidence of ruptured uterus was 1:161 deliveries. Twenty four (96%) of the uterine rupture occurred outside the teaching hospital. Seventeen (68.0%) of the patients had scarred uterus and eight (32.0%) had unscarred uterus giving a scarred to unscarred uterus ratio of 2.1:1. The uterine scars were lower segment caesarean section scar 12 (70.6%), classical caesarean section scar, two (11.8%), previous uterine rupture scar, two (11.8%) and myomectomy scar, one (5.9%). Of the women who had caesarean section, nine (64.3%) had primary while five (35.7%) had multiple caesarean sections. The biosocial characteristics of the women who were managed of ruptured uterus is shown in Table 1. The age range of the patients was 18-44 years with a mean of 30.8±6.3 years. The commonest age of occurrence 10 (40.0%) of uterine rupture is 30-34 years. Fifteen (48.0%) of the patients had secondary education, five (20.0%) had primary education, four (16.0%) had tertiary education and one (4.0%) had no formal education. Twenty (80%) of the patients were unbooked while five (20%) of the patients were booked. The parity of the patients ranged from Para 0 to Para 6 with a mean parity of 2.5±1.6. Uterine rupture occurred predominantly 19 (76%) in women of low parity (≤ para 3) while women of Para ≥4 accounted for six (24.0%) of the patients. The gestational age of occurrence ranged from 30-42 weeks with a mean of 38±3.8 weeks. Three (12.0%) of the patients ruptured antenatally, and 22 (88.0%) had intrapartum rupture. The identifiable risk factors in these women were as shown in Table 2.

There were oxytocic use in 12 (48.0%) of the cases and 13 (52.0%) of the women had at least one previous caesarean

Table 1: The biosocial characteristics of the women who were managed of ruptured uterus

	Frequency		Total (all)
	Scarred uterus	Unscarred uterus	
Age range			
16-19	0 (0.00)	1 (12.5)	1 (4.0)
20-24	1 (5.8)	1(12.5)	2 (8.0)
25-29	4 (23.5)	2 (25.0)	6(24.0)
30-34	9 (52.9)	1 (12.5)	10 (40.0)
35-39	2 (11.7)	3 (37.5)	5 (20.0)
40-45	1 (5.8)	0 (0.0)	1 (4.0)
Total	17 (100.0)	8 (100.0)	25 (100.0)
			P value = 0.226
Educational status			
Non formal	0 (0.0)	2 (25.0)	2 (8.0)
Primary	4 (23.5)	1 (12.5)	5 (20.0)
Secondary	12 (70.5)	2 (25.0)	14 (56.0)
Tertiary	1 (5.8)	3 (37.5)	4 (16.0)
Total	17 (100.0)	8 (100.0)	25 (100.0)
			P value=0.0185*
Parity			
nullipara	0 (0.0)	1 (12.5)	1 (4.0)
primipara	3 (17.6)	4 (50.0)	7 (28.0)
Multipara	11 (64.7)	2 (25.5)	13 (52.0)
G/multipara	3 (17.6)	1 (12.5)	4 (16.0)
Total	17 (100)	8 (100.0)	25 (100.0)
Booking status			
Booked	3 (17.6)	2 (25.0)	5 (20.0)
Unbooked	14 (82.3)	6 (75.0)	20 (80.0)
Total	17 (100.0)	8 (100.0)	25 (100.00
			P value=0.25
Gestational age at rupture			
≤36	5 (29.4)	1 (12.5)	6 (24.0)
37-40	9 (52.9)	3 (37.5)	12 (48.0)
≥41	3 (17.6)	4 (50.0)	7 (28.0)
Total	17 (100.0)	8 (100.0)	25 (100.0)

section. Obstructed labour was documented in 10 (40.0) of the cases. Seven of the women have had successful trial of labour after caesarean section before the occurrence of uterine rupture. Three (12.0%) of the patients had ruptured uterus following obstetric maneuvers like fundal pressure, manual removal of placenta and forceps delivery. There were 3 maternal deaths giving a maternal mortality rate of 74.6 per 100,000 deliveries. Fifteen of the babies were male while 10 were females. The birth weight range of the babies was 2.2 to 4.0 kg with a mean of 3.1±0.5 kg. The gestational age range at which the ruptured occurred was 30 to 42 weeks with a mean of 38±3.8 weeks. The fetal outcome was poor with 19 fetal deaths recorded. This gives a perinatal mortality rate of 1:212 deliveries. Sixteen of the fetal deaths occurred in unbooked patients while three deaths occurred among the booked patients. This however, was not statistically significant ($X^2 = 0.88$, $P = 0.348$). As shown in Table 3, the common presenting symptoms are abdominal pain 23 (92.0%), cessation of uterine contraction 19 (76.0%) and bleeding per vaginam 10 (40.0%). Fifty two percent of the patients were on state of shock at presentation. The complications and associated morbidity noted in the women are as shown in Table 4. Nineteen of the patients received blood transfusion.

At surgery the range of haemoperitoneum was 0-3.5 litres with a mean of 1.2 liters. The baby and the placenta were located in varied positions depending on the extent of the rupture. Seven (28%) were anterior uterine rupture with either right or left lateral extension while five (20%) were posterior ruptures with similar extensions. Eight (32.0%) and five (20%) were only anterior or posterior rupture without extensions respectively. Associated injuries noted were cervical tear (4), vaginal vault tear (4), bladder rupture (3), and fallopian tube and broad ligament tears (3). Regarding the mode of management, uterine repair only (42.0%) was the commonest surgery done in the patients, followed by hysterectomy (37.0%) and repair with bilateral tubal ligation(21.0%). The patients stayed between one and 31 days in the hospital with a mean of 10.9±5.9 days.

Discussion

Rupture of the gravid uterus is a catastrophic event with a significant effect on the reproductive function of the woman. It is a major contributor to the maternal and fetal morbidity and mortality. It is commonly associated with environments where the obstetric care is poorly advanced and delivery is either unsupervised or conducted by unskilled birth attendants. The incidence of uterine rupture of 1 per 161 (6.7 per 1000) deliveries found in this study is similar to reports from Enugu[7] Sagamu,[8] Ilorin[9] and Nepal.[10] This incidence is however, significantly higher than reports from Netherlands[11] and Canada.[12] The incidence of uterine rupture clearly relates to the level of maternity care provision, those areas with high maternal mortality tending to also have high uterine rupture rates.

Table 2: The identifiable risks found in these patients

Risk factors	Frequency	Percentage
1 previous c/s	4	16.0
Misoprostol +oxytocin	4	16.0
2 previous c/s	2	8.0
Previous uterine rupture	2	8.0
Oxytocin + prolonged obstructed labour	2	8.0
Prolonged obstructed labour + myomectomy scar + oxytocin	1	4.0
Oxytocin + fundal pressure	1	4.0
Classical c/s + oxytocin	1	4.0
Grandmultiparity + 1 previous c/s + oxytocin	1	4.0
1 previous c/s + manual removal of placenta	1	4.0
Prolonged obstructed labour	1	4.0
Oxytocin + forceps	1	4.0
1 previous c/s + oxytocin + fundal pressure	1	4.0
2 previous c/s + oxytocin	1	4.0
2 previous c/s + prolonged obstructed labour	1	4.0
1 previous c/s + misoprostol	1	4.0
Total	25	100.0

Table 3: The symptoms at presentation

Symptom	Frequency *N* = 25	Percentage *N* =100.0%
Abdominal pain + cessation of contraction +absence of fetal movement	10	40.0
Abdominal pain + bleeding per vaginam + cessation of contraction + absence of fetal movement	9	36.0
Bleeding per vaginam + vomiting + fainting attack	1	4.0
Fainting attack only	1	4.0
Abdominal pain only	4	16.0

Table 4: The complications and co-morbidities seen in the patients

Complications	Frequency	Percentage
Anaemia only	17	68.0
Anaemia+ sepsis	1	4.0
Anaemia + sepsis + VVF + wound breakdown	2	8.0
Wound breakdown +anaemia + sepsis	3	12.0
Anaemia + foot-drop + sepsis	2	8.0
Total	25	100.0

Eighty percent of the patients were unbooked and over 80 percent of the booked patients returned to the hospital either with ruptured uterus or at a stage when it is obvious that their condition is bad. The occurrences of uterine rupture among mostly unbooked patient have also been noted in other studies.[13-15] The differences in the level of obstetric practices, availability and utilization of the essential obstetric care services would account for the persistent high rate of uterine rupture in our environment and its rare occurrence in the developed economies. The socioeconomic status, poverty, literacy level and the acceptability of operative deliveries among these populations would also account for these differences too. The documented aversion of our women to operative deliveries[16] would have compelled the patients to patronize traditional birth attendants (TBAs), maternity homes, spiritual houses and homeopathic centres which lack the necessary skills to recognize abnormalities in antepartum, intrapartum and postpartum periods and are unable to provide a 24 hour essential obstetric care.

In contrast to the widespread belief that uterine rupture is a disease of multiparous women and occurs mainly in women of Para 4 and above,[17,10] in this study rupture of the uterus occurred mostly in women of low parity ≤ Para 3. There was a case of ruptured uterus in a nulliparous woman. This rare event of uterine rupture among the primigravid women have also been documented in other studies.[18] As in this study the usual predisposing factor is prolonged obstructed labour and injudicious use of Oxytocics in a primgravida with contracted pelvis which is an obstetric feature of developing countries with low socioecomic status.

This trend of increased uterine rupture among women of low parity could be as a result of increased primary caesarean section and rejection of subsequent operative delivery by the women. This fear of and aversion for caesarean section drives them away from centres with skilled manpower and facilities for operative delivery. Moreover, most of these patients live where there is lack of facilities with comprehensive obstetric care, poor referral system and the transport facilities are poorly developed that even when they are referred, there is a poor chance of their reaching the hospital.

The mean age and age group most affected by uterine rupture in this study is similar to the ones documented in other studies.[17,22]

Like in other studies scarred uterus, prolonged obstructed labour and injudicious use of oxytocics are the major risk factors identified in this study.[7,8,10,19,20,21] Worthy of note in this study is the fact the most of the rupture were as a result a combination of risk factors. Oxytocics were injudiciously administered in most of the cases by inexperienced, untrained, and possibly non-medical personnel. Even patients with classical caesarean section, more than 2 previous caesarean sections and contracted pelvis had oxytocics administered to them.

The noted scarred to unscarred uteri ratio of 2.1:1 is similar to 3:1 noted in Singapore[22] but a reverse of 1:1.7 noted in Afikpo.[17] It has been documented in various studies that as a result of rising caesarean section rate in Nigeria and sub Saharan Africa scared uterus are increasingly contributing to uterine rupture.[18] Although lack of necessary caesarean section is attributed to be a cause of high maternal mortality and morbidity however, the increasing caesarean section in sub-Saharan Africa might impose additional hazard of increasing the rates of uterine rupture without reducing the rates of maternal morbidity and mortality and stillbirth rates.[18] Ignorance, poverty, low status of women, illiteracy, cultural belief and aversion for caesarean section are the major reasons why the women do run away from skilled care and attempt trial of vaginal birth in unorthodox places despite the attendant risks. The sudden upsurge in deliveries in spiritual churches at supposed cheaper cost is also a big risk for future occurrence of uterine rupture in women with previous caesarean section.[23]

The finding in this study that 28% of the patients with uterine rupture have had successful vaginal birth after caesarean section (VBAC) is remarkable. This brings to fore the fact that prior successful vaginal birth after a previous caesarean section does not eliminate the risk of uterine rupture in subsequent pregnancies. It is also pertinent to note that fetal macrosomia did not contribute to the cause of uterine rupture. The rupture occurred mostly among women with fetuses whose weights were within normal age range. This would have given the patients and their caregivers a false sense of confidence that they would be able to deliver vaginally without any complications despite the recognizable risk factor.

As in some other studies anterior uterine wall rupture with various extensions is the commonest site of uterine rupture. The observed involvement of the cervix, vaginal vault, urinary bladder, fallopian tube and broad ligament are known complications of uterine rupture.The rupture of unscarred uterus more commonly involves the cervix and vagina while the rupture of scarred uterus usually involves the urinary bladder.[24]

The mainstay of treatment of uterine rupture is surgery. The extent of the surgery however, depends on the severity of the rupture, the state of the patient, her future reproductive wish and the extent of the consent given by the patient. It can also be influenced by the skill of the attending surgeon. The commonest procedure carried out was uterine repair only. This is usually associated with lesser morbidity and lesser operation time. The other procedures are uterine repair with bilateral tubal ligation, subtotal and total hysterectomy.

Anaemia and sepsis were the commonest complications noted in our patients. This is expected because uterine rupture is a traumatic event and haemorrhage is part of its pathophysiology. In addition prolonged labour, prolonged rupture of membrane and anaemia which are part of the events associated with uterine rupture predisposes to infection and sepsis. The co-morbidities noted in this study like vesicovaginal fistula (VVF) and foot-drop are part of the obstructed labour injury complex.

The high maternal and perinatal morbidity and mortality rate recorded in this study supports the preposition that uterine rupture is a major cause of maternal and perinatal morbidity and mortality in our environment[5] characterized by poor obstetric care, limited healthcare by skilled healthcare providers, poor prenatal care and aversion for operative delivery. Similar high perinatal and maternal mortality rate has also been reported in other studies.[5,7,8] This is in contrast to the observation in the Netherlands where there was no maternal death due to uterine rupture and over 90% of the fetuses were salvaged.[11] Late presentation to the hospital is a major cause of this poor prognosis. This late presentation could be as a result of poverty, delayed referral, poor transport network, and poor ambulance services.

This study reveals that there is still a high prevalence of uterine rupture in our environment. Uterine rupture is associated with high maternal and perinatal morbidity and mortality. This trend if not checked will jeopardize the realization of millennium development goal (MDG) 4 and 5 which seek to reduce perinatal and maternal mortality respectively. The observed risk factors for uterine rupture in this study are also preventable. Laws regulating the practice of Obstetrics defining who, where and minimum standards required should be promulgated. Adequate health education, widespread presence of comprehensive obstetric care centres, improved antenatal care, reduction in the rate of primary caesarean section and empowerment of the women population will reduce if not eliminate the rupture of gravid uterus.

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