

A Seven- year Review of Uterine Rupture at a Tertiary Health Facility in Port Harcourt, Nigeria

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Abstract

Background: Uterine rupture is a dire obstetric catastrophe commonly encountered in developing countries.

Objective: This study was carried out to assess the fetal and maternal outcomes of ruptured uterus at the University of Port Harcourt Teaching Hospital over a seven-year period and to make recommendations at improving outcome.

Methods: This was a retrospective hospital-based study in which the case files of patients who had ruptured uterus within the study period were retrieved and relevant information extracted for analysis. Chi square was used to compare discrete variables and p value < 0.05 was regarded as significant.

Results: The prevalence of uterine rupture was 1.56%. The mean age and parity were 30.5 ± 4.5 years and 3.5 ± 2.6 respectively. One hundred and twenty cases (73.8%) were associated with scarred uterus and 50.6% occurred following induction of labour especially by unskilled personnel. Anaemia, febrile illness and wound sepsis were the most common post-operative complications and these were significantly associated with unbooked status. The perinatal mortality rate was 839.3/1000 total births and babies of unbooked mothers were about seven times more likely to die than babies of booked mothers (Odds ratio = 6.75)

Conclusion: Uterine rupture is essentially a disease of the unbooked patient and is associated with scarred uterus and induction of labour. Uterine rupture is linked with high fetal wastage especially among the unbooked patients. Making antenatal care easily accessible to all pregnant women and specialist care during pregnancy and labour especially in high risk patients may improve outcome.

Keywords: Ruptured uterus, fetal outcome, maternal outcome, Port Harcourt

Introduction

Uterine rupture is an obstetric catastrophe associated with high maternal and perinatal mortality and morbidity.¹ It is the leading indication for emergency peripartum hysterectomy in low income countries but it is relatively uncommon in high income countries.^{1,2} Uterine rupture is defined as a tear in the wall of the pregnant uterus.¹ It may be complete or incomplete.¹ Uterine rupture is complete when the visceral peritoneum overlying the uterus is also torn allowing direct communication between the endometrial and peritoneal cavities while in incomplete rupture, the overlying peritoneum remains intact.¹ The incidence of uterine rupture varies worldwide and in the same country depending on the quality of healthcare.¹ The incidence is 1:1424 deliveries in USA, 1:2500 in Great Britain, 1:225 in India, 1:96 in Turkey, 1:1362 in South Africa, 1:93 in Uganda, 1:124 in Ghana and in Nigeria 1:112.¹

The indirect factors contributing to uterine rupture are poverty, illiteracy, infection, unhealthy socio-cultural practices (such as abdominal massage, fundal pressure), aversion to caesarean section and unskilled attendant during labour and delivery.¹⁻⁷

Neglected obstructed labour, high parity, scarred uterus, intrauterine manipulation, operative vaginal delivery, congenitally malformed uterus, adherent placenta, trophoblastic disease and misuse of oxytocics are the established causes of ruptured uterus¹⁻⁷. In the primigravida unscarred uterus, spontaneous rupture following obstructed labour is uncommon.¹ Uterine rupture rate in previous caesarean scar is 0.2-0.5% and 3-4% in classical incision scar or vertical scar in the upper uterine segment.^{1,3}

The clinical features of uterine rupture depend on the extent of the rupture, accompanying intra-peritoneal bleeding

and time lapse from rupture to appropriate intervention.¹⁻³ The clinical features include; cessation of uterine contractions, vaginal bleeding, haematuria, severe abdominal pain, easily palpable foetal parts, evidence of free peritoneal fluid, foetal distress and fetal demise. Maternal mortality is inevitable if timely resuscitation and definitive intervention is not instituted.^{1,8}

The principles of treatment of ruptured uterus includes; intensive resuscitation with intravenous crystalloids and blood transfusion, administration of broad spectrum antibiotics and emergency laparotomy (repair of uterus with or without bilateral tubal ligation, sub-total or total abdominal hysterectomy) and adequate post-operative care. The decision to perform hysterectomy or repair the uterus depends on the in-situ anatomy of the rupture, the clinical state of the patient and the skill of the surgeon.¹

This study sought to determine the prevalence, fetal and maternal outcomes of this important obstetric condition at the University of Port Harcourt Teaching Hospital (UPTH) and to compare outcome with previous studies.

Materials and Methods

The study was conducted at the UPTH. The study period was from 1st January 2011 to 31st December 2017. The folders numbers of patients with ruptured uterus were retrieved from the booked and unbooked labour ward records and relevant information were extracted from the case files. Information extracted were the age, parity, educational status, identified risk factors for ruptured uterus, clinical features, intervention rendered, definitive treatment offered, fetal and maternal outcome and post- operative complications. Data were entered and analysed using SPSS version 21 software package and data was presented as simple proportion and

frequency tables. Chi square was used to compare discrete variables and *P* value of 0.05 was regarded as significant and Odds ratio to test risk of association. All cases of asymptomatic uterine dehiscence discovered as incidental finding at caesarean section were excluded from the study. The study was approved by ethical committee of the University of Port Harcourt Teaching Hospital.

Results

One hundred and seventy-nine (179) patients out of 11462 deliveries within the study period had uterine rupture giving a prevalence of 1.56% with about 15 cases

recorded per year. However, 168 files retrieved had sufficient information for analysis giving a retrieval rate of 93.8%. One and twenty- seven (75.6%) cases were unbooked (did not receive specialized care) while 41 (24.4%) cases were booked (had specialized care during pregnancy and delivery). The mean age of the patients was 30.5 ± 4.5 years with a range of 20 -38 years, the mean parity was 3.5 ± 2.8 with a range of 0-7 while the mean gestational age at delivery was 37.5 ± 4.6 and ranged from 33-43 weeks. Most (46%) of the patients had primary level of education as shown in table 1 below.

Table 1: Sociodemographic characteristic (n=168)

Characteristics	Frequency	Percentage
Age		
20-24	9	5.3
25-29	29	17.3
30-34	109	64.9
35-39	18	10.7
40 and above	3	1.8
Total	168	100
Parity		
0	15	8.9
1	64	38.1
2-4	73	19.6
5 and above	16	9.6
Educational level		
None	12	7
Primary	77	46
Secondary	57	34
Tertiary	22	13

One hundred and twenty-four (73.8%) cases of uterine rupture were associated with scarred uterus and mostly previous caesarean section while 44 (26.2%) occurred in unscarred uterus. Overall 105 patients had previous caesarean section out of which 85 (50.6%) had one previous caesarean section while 14 (8.3%) and 6 (3.6%) had two and three previous caesarean sections respectively. Table 2 shows the possible risk factors of ruptured uterus and booking status.

Table 2: Risk factors associated with uterine rupture

Risk Factor	Booked	Unbooked	Total	Odds ratio	P value
Prev LSCS	32	73	105	1.6	0.01
Prev Classical Scar	0	9	9	Undefined	0.07
Prev. myomectomy	2	7	9	1.14	0.6
Prev. hystorotomy	0	1	1	Undefined	0.56
Previous cornual ectopic	0	2	2	Undefined	0.42
Grandmultiparity	2	5	7	0.8	0.54
Obstructed labour	4	18	22	1.53	0.47
Induction of labour	4	11	15	0.8	0.83

Prev. - Previous

LSCS - Lower segment caesarean scar

Most of the patients 157 (93.5%) were in labour at the time of rupture. Seventy-two (42.9%) occurred following spontaneous labour, 85 (50.6%) cases occurred following attempt at induction of labour while 11 (6.5%) cases were not associated with labour. Most of the inductions in the unbooked patients were conducted by traditional birth attendants following injudicious use of oxytocics and in maternity homes before their presentation at UPTH. Intra-operatively, the estimated blood loss ranged from 1,200 to 3,400 millilitres. Hemoperitoneum was identified in 157 (93.45%) of the patients while in 113 (67.3%) of cases the fetus was completely extruded into the peritoneal cavity. All patients received blood transfusion and ranged from 2 to 10 units of blood. In terms of the definitive treatment carried out, 21 (12.5%) had total abdominal hysterectomy (TAH), 28 (16.7%) had subtotal hysterectomy, 95 (56.5%) had repair alone while 24 (14.3%) had repair with tubal ligation. Unbooked patients were almost twice more likely to have hysterectomy when compared to booked patients (odds ratio=1.63, $P=0.24$). All surgeries were performed by either consultants or experienced senior registrars. Table 3 shows the post-operative complications of uterine rupture.

Table 3: Postoperative Complications (n=168)

Complication	Frequency	%	Booked	Unbooked	Odds ratio	P value
Post op anaemia	163	97.0	39	124	2.1	0.40
Febrile illness	62	34.5	7	51	3.3	0.006
Wound sepsis	47	27.9	5	42	4.1	0.04
Shock	39	23.2	8	31	1.3	0.52
UTI	16	9.5	4	12	0.97	0.58
Wound dehiscence	12	7.1	3	9	0.97	0.60
Bladder injury	9	5.4	2	7	1.1	0.90
Ureteric injury	6	3.6	1	5	1.64	0.65
RTI	5	3.0	1	4	1.3	0.80
AKI	4	2.4	1	3	0.97	0.70
Maternal deaths	3	1.8	0	3	Undefined	0.32
Bowel injury	2	1.29	0	2	Undefined	0.41

OP – Operative
 UTI – Urinary Tract Infection
 RTI – Respiratory Tract Infection
 AKI – Acute Kidney Injury

The most common complications were anaemia, febrile illness and wound sepsis. Febrile illness and wound sepsis were significantly associated with unbooked status and these complications were twice more likely to occur in the unbooked patients as shown by the Odds ratio. Three maternal deaths occurred amongst the unbooked patients. The case-fatality rate was 1 in 56 cases with 1.8% of maternal deaths. The primary causes of deaths were hypovolaemic shock from severe haemorrhage.

Table 4: Fetal Outcome (n=168)

Outcome	Total	%	Booked	Unbooked	Odds ratio	P value
Alive and healthy	16	9.5	11	5	0.12	0.00004
Still-born	134	79.6	21	113	6.3	0.00000
Asphyxia, survived	11	6.4	4	7	0.54	0.33
Asphyxia, died	7	4.1	3	4	0.41	0.25

The foetal outcome is as shown in table 4. Unbooked status was significantly associated with stillbirth and babies of unbooked mothers with ruptured uterus were about 6 times more likely to die when compared to babies of booked mothers ($\chi^2=20.17$, Odds ratio=6.75, $P = 0.00$). The perinatal mortality rate was 839.3/1000 total birth.

Discussion

Ruptured uterus is essentially a disease of the unbooked patient who had no specialized form of care during labour as over 70% of the patients in this study were unbooked. Uterine rupture still remains one of the most serious obstetrical emergencies with dire fetal and maternal complications.⁹ The prevalence of one in 64 deliveries (1.56%) for uterine rupture in this study is similar to that reported in previous publications.^{10,11} The incidence was one in 258 deliveries in a 5-year study reported by Nyengidiki et al in 2007 in the same centre showing a rising trend of more than 3 folds when compared to current findings.¹² This

may be due to the rising incidence of previous caesarean sections and grandmultiparity. This study identified scarred uterus with previous lower segment caesarean section as the single most important risk factor for uterine rupture similar to findings by Nyengidiki et al.¹² Therefore, a great degree of caution should be taken while managing patients with previous uterine scar who are attempting vaginal delivery. Such high-risk pregnancies should ideally not be managed in homes of TBAs and hospitals that are not well equipped to deal with obstetric emergencies. Hamilton *et al.*, reported that with labour dystocia (cervical dilatation lower than the 10 percentile and arrest for more than 2 hours), caesarean delivery prevents more than 42.1% cases of uterine rupture therefore parturient with previous caesarean section at the slightest sign of non-progressive or difficult labour should have timely caesarean section performed.¹³ However, majority of the patients in this study who were unbooked could not benefit from such specialized care and

timely decision hence the high incidence of rupture in this study. With the ever-increasing incidence of caesarean section, the prevalence of uterine rupture will continue to soar unless parturients stop patronising TBAs and proper intrapartum monitoring of parturients at risk of uterine rupture with timely referral are instituted.^{1,14} Surgical intervention is imperative for all cases of ruptured uterus. Rent repair requires less operative time and is a better option for hemodynamically unstable patients if the repair can be carried out successfully. Opinion defers as to the preferred surgical technique but repair is the most common surgery performed and a relatively safer treatment.^{1,15,16} In this study, successful repairs were achieved in 70.8% of cases with 56.5% without tubal ligation and thus with potential for future pregnancy. Repair alone increases the possibility of recurrence of rupture in subsequent pregnancies, with reported incidence of 5%^{3,17,18} Therefore, patients who had repair without tubal ligation should be counselled on the risk of a repeat ruptured uterus, need for specialist care and the role of elective caesarean delivery in subsequent pregnancy. Similarly, patients who had subtotal hysterectomy should be also be counselled on the risk and prevention of cervical cancer and in our environment where cervical cancer is still highly prevalent, total abdominal hysterectomy rather than subtotal hysterectomy should be encouraged.¹⁹

This study reported three maternal deaths amongst the unbooked patients. Other studies reported 0- 13% of maternal deaths.^{3,5,20} The 1.8% maternal deaths reported in this study is significantly lower than the 17.5% reported by Nyengidiki et al in 2007.¹² The reduced maternal mortality in this study may be attributed to specialist input and improvement in blood transfusion services. Surgical intervention

within 30 minutes after uterine rupture is diagnosed is associated with good long-term neonatal outcomes.²¹ Prompt intervention is thus helpful in reducing the occurrence of fetal asphyxia and fetal mortality. However, majority of our patients were unbooked and were transferred to the hospital after obstructed labour or uterine rupture was suspected or diagnosed. The delay between onset of rupture and delivery may have contributed to the high neonatal morbidity and mortality recorded in this study. Early identification of non-reassuring foetal heart rate patterns can help the obstetrician to suspect uterine rupture early.¹ Continuous fetal monitoring was instituted for some of the booked patients who were at risk for uterine rupture and this assisted in the early diagnosis and prompt intervention thus accounting for the more favourable neonatal outcome in the booked patients when compared to the unbooked patients. The perinatal mortality rate of 839.3/1000 in this study is slightly higher than the 800/1000 reported by Nyengidiki et al in 2007 showing no improvement in fetal outcome.¹²

Uterine rupture as demonstrated in this study was associated with serious postoperative complications irrespective of booking status. Febrile illness, wound sepsis and post-operative anaemia were the only post-operative complications significantly associated with unbooked status. As expected, wound sepsis and febrile illness occurred more in the unbooked patients because of the unhygienic practices these women were subjected to by traditional birth attendants (TBA). The post-operative complications that were not recorded among the booked patients were bowel injury and maternal death and this simply implies that both booked and unbooked patients were likely

to suffer similar fate once ruptured uterus occurs though the frequency and severity of complications were more in the unbooked patient. The practical way of preventing these serious post-operative complications is to prevent uterine rupture at all levels of care.

Conclusion

Uterine rupture is a major contributor to maternal morbidity and neonatal mortality and is essentially a disease of the unbooked patients. History of scarred uterus was the main risk factor identified in this study. Extreme caution should be taken when managing patients with a previous uterine scar. Unbooked status was significantly associated with increased fetal complications and perinatal mortality. Women with risk factors for uterine rupture should be managed in well-equipped centres for emergency obstetric care in order to improve outcome as well as prevention of this condition.

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