

Incidence of uterine rupture in a Teaching Hospital, Sudan

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ABSTRACT

Objectives: This study aims to document the experience of uterine rupture as a serious common complication of pregnancy in some developing countries like Sudan. The study is also aimed at reviewing the main contributing factors so as to draw broad lines for a strategy of prevention.

Methods: A retrospective study carried out at Medani Teaching Hospital, Medani City, Sudan. Case notes were reviewed for all patients with uterine rupture from 1st January 1992 through 31st of December 1997. The data was analyzed and the literature was reviewed to compare the results of similar studies.

Results: Out of the total number of deliveries in that period (n=21190), 86 cases were diagnosed to have uterine rupture giving an incidence of 1:246. The main contributing factor to uterine rupture identified in this study, was poor ante-natal care (64%). One most important direct cause of uterine rupture was previous cesarean section scar with or without cephalopelvic

disproportion (n=39) (45%). Seventy-six cases, had complete rupture of uterus. Subtotal hysterectomy was carried out on 69 cases (80%) and 15 cases (17%) had uterine repair with bilateral tubal ligation. Three patients developed vesico vaginal fistula (3.5%). The ureter was iatrogenically severed in 2 cases (2%). There were 6 (7%) maternal deaths and 68 (79%) perinatal deaths.

Conclusion: This study confirms the existence of a serious preventable obstetrical problem. Poor antenatal care, poor provision of health service and low socioeconomic standards, are the main factors contributing to uterine rupture. Those findings would suggest that both social and medical improvements will significantly improve survival in mothers with ruptured uterus and reduce the perinatal loss.

Keywords: Uterine rupture, maternal mortality, perinatal mortality.

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Uterine rupture is a serious complication of pregnancy associated with high maternal and perinatal mortality rates and an incidence of 17% maternal death and 59% perinatal mortality was reported from Harare, Zimbabwe¹, 7% of maternal death and 64% perinatal mortality from Sudan.² However, from Nigeria a maternal mortality of 22% and perinatal mortality of 88% were reported.³ Uterine rupture is a catastrophic event in any woman's life as the patient might lose her future fertility due to inevitable hysterectomy in

many patients. Total abdominal hysterectomy has been considered by many authorities as the treatment of choice in cases of ruptured gravid uterus because of the risk of recurrent rupture in a future pregnancy.⁴⁻⁸

Reported incidence of rupture of uterus varies from 1:19 to 1:2500 deliveries.⁹ Flannelly et al,¹⁰ in a 10 years review in Dublin, reported an incidence of 1:3300 deliveries. On the other hand Onwuhafua et al³, reported an incidence of 1:137 deliveries in Kaduna, Nigeria.

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This paper documents the experience of the common complications of pregnancy in developing countries like Sudan. The study is also aimed at reviewing the incidence, risk factors, clinical presentations, maternal mortality and morbidity and perinatal mortality associated with rupture of gravid uterus. It also attempts to draw broad lines for a strategy of prevention.

Methods. The study was carried out at Medani Teaching Hospital (MTH) in Medani City, Sudan. Case notes were reviewed for all patients with uterine rupture from 1st January 1992 through 31st of December 1997. Relevant data relating to the age, parity, direct causes, clinical presentations, type of uterine rupture, operative procedures, maternal and perinatal outcome were collected. Complete rupture of the uterus in this study is referred to as rupture of the uterus involving all layers including the serous coat of the uterus, while the incomplete rupture of the uterus denoted that at least the serous coat is intact.¹¹ The literature was reviewed to compare the results of similar studies.

Results. Eighty-three cases of uterine rupture during labor and 3 cases before labor (total of 86 cases) were diagnosed from the hospital records between the 1st of January 1992 and the 31st of December 1997. During that period there were 21190 deliveries. The overall incidence of uterine rupture was 1:246.

Age and parity. Fifty-three cases (62%) were of the age of 30 years and above. Only 2 cases (2%) were less than 20 years of age, (Table 1). Sixty-two cases (72%) were patients with parity of 4 or more. There was only one primigravida who had rupture of uterus and that was due to internal version for retained 2nd twin which was carried out at home by a traditional birth attendant, (Table 2). Out of the total number of the hospital deliveries (n=21190), only 8000 (38%) were booked cases. All cases with uterine rupture were unbooked except one case. Sixty-one cases (71%) with uterine rupture were from rural areas and 25 cases (29%) were from urban areas.

Direct causes of uterine rupture. Table 3 shows the direct causes of uterine rupture. Previous cesarean section scar, with or without cephalo-pelvic disproportion (n:39) (45%) was the most frequent cause.

Clinical presentation on admission. The most common clinical presentations were cessation of uterine contractions by the time they arrived at hospital, 72 cases (84%), tachycardia (pulse of 110 beat per minute or more), 69 cases (80%), and absence of fetal heart beat 68 cases (79%). Twenty seven patients (31%) presented with cardiovascular

Table 1 - Age distribution with ruptured uterus.

Age in years	Number of cases (percent of total n = 86)
< 20	2 (2)
20-24	12 (14)
25-29	19 (22)
30-34	26 (30)
35-39	17 (20)
40-44	9 (10.5)
>44	1 (1)
	86 (100)

Table 2 - Parity distribution with rupture of uterus.

Parity	Number of cases (percent of total n = 86)
1	1 (1)
2	10 (12)
3	13 (15)
4	26 (30)
5 or more	36 (42)
Total	86 (100)

Table 3 - Direct causes of ruptured uterus.

Factor	n (%)
Cesarean section scar with or without cephalo-pelvic disproportion	39 (45)
Transverse lie	11 (13)
Oxytocin	9 (10.5)
Breech + big baby	5 (6)
Forceps delivery	5 (6)
Brow presentation	4 (5)
Hydrocephalus	5 (6)
Retained second twin	3 (3.5)
Face presentation (Mento-posterior)	2 (2)
Spontaneous rupture (Patients not in labor)	3 (3.5)
Total	86 (100)

Table 4 - Clinical presentation on admission.

Findings	n (%)
Cessation of uterine contractions	72 (84)
Rapid pulse (110+/minute)	69 (80)
Absence of fetal heart sounds	68 (79)
Vaginal bleeding	59 (69)
Severe abdominal pain	49 (57)
Pallor	36 (42)
Systolic BP < 100 mmHg	27 (31)
Easily palpable fetal parts	15 (17)

shock, (Table 4). Eighty-two patients (95%) were brought to hospital in labor, and 3 cases were brought with ruptured gravid uterus before labor and before term. The main clinical presentation in those 3 cases were abdominal pain, tachycardia and anemia. The first case had a previous classical cesarean section scar, the 2nd had previous hysterotomy scar for vesicular mole, and the 3rd has spontaneous uterine rupture at the site of placental insertion. Seventy patients (81%) were subjected to manipulation by non-skilled medical personnel (Village Midwives).

In this study, patients with uterine rupture arrived late to hospital, and hence the provisional diagnosis of uterine rupture was correct in 50 cases (58%). In 2 cases (2%) the diagnosis was missed and only made during cesarean section. In the remaining 36 cases (39.5%) the diagnosis was suspected and confirmed during cesarean section or laparotomy. Seventy-six cases (88%) had complete rupture of uterus while 9 cases (10.5%) had incomplete uterine rupture. Fifty-eight cases (67%) had an anterior lower segment uterine rupture and 27 patients (31%) had rupture at

other different sites of the uterus. The site of rupture in the patient who arrived dead to hospital was not known. Sixty-nine cases (80%) were found to have a uterine rupture beyond repair so subtotal hysterectomy was performed. In 15 cases (17%), the uterus was repaired together with bilateral tubal ligation as it was thought that future pregnancy could be hazardous. One patient who was para one had uterine repair only. All patients had blood transfusion (the mean was 4 + 1.2 units). Additional operative procedures were performed in 3 patients, 2 patients had end to end anastomosis of the right ureter which was iatrogenically injured during hysterectomy, and one patient had a repair of ruptured urinary bladder.

Maternal complications. Eighteen cases (21%) developed respiratory tract infection and 16 cases (19%) had urinary tract infection. Wound sepsis occurred in 12 cases (14%) and deep vein thrombosis in 2 cases (2%). The right ureter was severed in 2 cases, (2%). The injury was discovered during the operation and treated surgically by the urologist. Three patients developed vesico-vaginal fistula. In one case the cause was due to involvement of the urinary bladder during the rupture of uterus. The urinary bladder was repaired during the laparotomy for uterine rupture but, despite that, the patient developed vesico-vaginal fistula 14 days later. In the other 2 cases who had repair of uterus and bilateral tubal ligation, urinary incontinence developed after 10 days post-operatively and the cause was due to obstructed labor.

Maternal and perinatal outcome. There were 6 (7%) maternal deaths in association with a uterine rupture during the reviewed period, (Table 5). Five of those maternal deaths had parity between 3 and 12 and the age of 30-40 years. Three patients died because of septicemia although they received routine keflex and gentamycin injections with flagyl infusion. Two died due to severe hemorrhage and

Table 5 - Maternal deaths (n=6).

Number of Patients	Age in Years	Parity	Direct cause of Ruptured Uterus	Surgical procedure	Interval between operation and death	Cause of death
1	24	Primigravida	Retained second twin	Repair of uterus	5th day	Septicemia
2	30	6	Breech present + big baby	Subtotal hysterectomy	6th day	Septicemia
3	33	4	---	---	Dead on Arrival	Hemorrhage
4	39	8	Obstructed labor	Subtotal hysterectomy + suture of cervix	8 hours after delivery	Hemorrhage
5	42	12	Obstructed labor	Subtotal hysterectomy	4th day	Septicemia
6	30	3	Antepartum rupture association with abruption placenta	Repair uterus + bilateral tubal ligation	2nd day	Dissiminated intravascular coagulopathy (hemorrhage)

one died as a result of disseminated intravascular coagulation (DIC). Eighty-seven infants (one set of twins) resulted from 86 pregnancies. Sixty-eight perinatal deaths (79%) occurred, all were stillborn.

Discussion. Rupture of the uterus is a serious complication of child birth and remains one of the major causes of maternal and perinatal mortality.^{2,3,12} The incidence of uterine rupture in this study does not differ markedly from 1:223 reported from Morocco,¹³ and 1:247 reported from Tanzania.¹⁴ It is however, higher than 1:651 reported from the same country – Sudan,² and 1:966 reported by Vedat et al¹⁵ and much higher than 1:3369 reported from Saudi Arabia¹⁶ and of 1:3300 reported from Ireland.¹⁰ Those high incidences in developing countries have been attributed to poor antenatal and intranatal care resulting from several factors such as ignorance, poverty and inadequate health facilities.^{2,3,17} On the other hand scarred uterus and oxytocin administration were found to be the predominant factors of uterine rupture in the developed countries.^{17,18}

One of the main contributing factors to uterine rupture identified in this study is poor ante-natal care, where 64% of the patients with uterine rupture were unbooked and it was also observed that 71% of patients were from rural areas. Such patients have inadequate health facilities as they live distant from hospital services. They have difficulty in transportation, they are poor and illiterate. For these reasons they arrived late at hospital as unbooked cases with obstructed labor or with ruptured uterus. The high percentage (45%) of patients with previous scar probably accounts for the high incidence of ruptured uterus in this report. It has been previously noted that uterus with previous classical scar tends to rupture before the onset of labor.^{6,19}

Three patients in this series sustained uterine rupture before labor. One of those patients had a previous classical scar, one had a hysterotomy for vesicular mole and the 3rd patient had antepartum rupture associated with abruptio placenta. The high risk group of patients for rupture of the uterus are those of 30 years of age or more (62%) and para 4 and above (72%) and with previous uterine scar. This is in agreement with the findings of Onwuhafua et al³ and Bakour et al.¹⁸ In this group of patients there is a tendency for larger babies, malpresentations and malpositions. Perhaps uterine rupture occurs due to prolonged, obstructed labor with or without cephalo pelvic disproportion. In this study, the most important factor for uterine rupture was one or more previous cesarean sections, (45%). This is in agreement with other authors.^{3,20} In those cases, the rupture of uterus was avoidable if the patient was attending the antenatal care or even if she reported to hospital earlier once she felt labor pains. Nine

patients (10.5%) had uterine rupture due to injudicious syntocinon administration. In 6 patients syntocinon was given by midwives at home and for 3 patients, syntocinon was administered in hospital but the supervision was inadequate. The law prohibits the use of syntocinon outside the hospital. Unqualified medical personnel such as traditional birth attendants should not be allowed to use oxytocin, and further, strict laws should be promulgated to ensure that such potent drugs are not used outside the hospital. Rupture of uterus in a primigravida is rare as shown by Flannelly et al¹⁰ who found no uterine rupture in almost 28000 primigravidae despite a 40% rate of oxytocin augmentation. In this study, only one primigravida who ruptured her uterus as a result of internal version for a retained 2nd twin carried out by unqualified traditional birth attendant. The maternal mortality rate of (7%) associated with uterine rupture in this series, is high if compared with the (1.5%) reported by O'Connor et al²¹, but comparable to 7% of Mokgokong and Marivate.¹² On the other hand, it is far lower than the incidence of (22%) reported from Nigeria.³ This could be explained by the standard of provision of health service in the developing and developed countries. The operative procedure was undertaken as emergency, and the choice of the surgical procedure depended on the type, extent and location of the rupture as well as the patient's condition, and desire for more children. In spite of a well documented series²¹⁻²³ which suggested the safety of pregnancy following a simple repair of lower segment rupture provided subsequent delivery was by cesarean section at 37 weeks pregnant, all patients in this study, except one, had either subtotal hysterectomy or repair with bilateral tubal ligation. This is because it was thought that our patients have poor antenatal attendance and the risk of recurrent uterine rupture in the next pregnancy was likely to be high in such patients.

This study confirms the existence of a high incidence of uterine rupture as a serious complication of pregnancy. The findings in this study are reflective of situations in developing countries. We believe that social and medical improvements in developing countries, like Sudan, will significantly improve survival in mothers with ruptured uterus and reduce the perinatal loss.

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