

# Ruptured uterus-eight year retrospective analysis of causes and management outcome in Adigrat Hospital, Tigray Region, Ethiopia

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## Abstract

**Background:** Ruptured uterus is a common cause of maternal and perinatal mortality and morbidity. Further studies may help in the development of preventive strategies.

**Objective:** To determine the frequency, cause and management outcome of ruptured uterus at a zonal hospital.

**Method:** A retrospective study (April 1, 1993-March 30, 2001) was done to describe the frequency, cause, treatment, complications, and maternal and fetal mortality associated with ruptured uterus. A structured questionnaire was used to collect information from delivery registration books, operation room records, and patient cards.

**Result:** A total of 54 cases of ruptured uterus and 5,980 hospital deliveries were recorded for a ratio of 1:110. Causes of rupture were: cephalopelvic disproportion (53.7%), malpresentation and malposition (25.9%), instrumental (3.7%), pitocin induced (3.7%), uterine scar (11.2%) and placenta percreta (1.8%). Most were multipara and rupture was complete in 94.4%. Site of rupture was in lower uterine segment in 58.5% and left lateral in 24.5%. Ten cases (18.5%) had associated bladder injury. Total abdominal hysterectomy was performed in 20 (37%), subtotal abdominal hysterectomy in 13 (24.2%) and repair in 21 (38.9%) cases. Vesicovaginal fistula and wound infection were common post-operative complications. Maternal case fatality rate was 11.1% and fetal case fatality rate was 98.1%. Ruptured uterus contributed 24% of all causes of maternal deaths in the hospital within the study period.

**Conclusion:** This calls for an integrated effort to prevent the causes of uterine rupture and ensure prompt management to reduce maternal and perinatal mortality and morbidity. [*Ethiop.J.Health Dev.* 2002;16(3):241-245]

## Introduction

Ethiopia is one of the less developed countries where maternal and perinatal mortality rates are still very high. The maternal mortality ratio in Ethiopia is one of the highest in sub-Saharan African, 400-700/100,000 live births and the perinatal mortality is also high (1). One of the major causes of maternal and perinatal mortalities is rupture of the uterus (2-4). This obstetrics hazard is also associated with short term maternal morbidities such as

vesicovaginal fistula, rectovaginal fistula, bladder rupture, foot drop, psychological trauma, anemia and in the long term because of the surgical intervention, the woman may be sterilized which can lead to divorce and loss of economic support (5).

The occurrence of ruptured uterus varies in different parts of the world. In the developed world the frequency has dropped significantly (6-8). Nevertheless, it is still a major public health problem in developing countries in general and Africa in particular (9-11). A hospital-based study in Ethiopia reported that it is a common obstetric cause of maternal and

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fetal mortalities. The same study reported that uterine rupture occurred one in every 38 deliveries (2).

This sudden catastrophic event has different causes. Unlike in the developed world where oxytocin stimulation and scarred uterus are the major causes (6,8), in less developed countries fetopelvic disproportion causing obstructed labor is the major cause of uterine rupture (9-11).

Different modes of management are practiced, namely repair of the uterine tear, total abdominal hysterectomy and subtotal abdominal hysterectomy. The preference of management and outcome varies in different centers (10,12-14).

This retrospective study was done to address the frequency of ruptured uterus and the associated maternal and perinatal morbidities and mortalities. To our knowledge no study was made regarding this obstetric problem from this part of the country, though similar studies are done elsewhere in Ethiopia. This report may address the issue more and can be important in the development of preventive strategies. The major objective of this retrospective study is to determine the frequency, cause and management outcome of ruptured uterus at a zonal hospital.

### Methods

Adigrat Zonal Hospital is located 1000 kms away from Addis Ababa. Totally the hospital has 110 beds and there are 20 nurses, 36 health assistants, 4 general practitioners, 1 pediatrician and 1 gynecologist and obstetrician. The department of gyne-obs. has a total of 37 beds among which 13 beds belong to the maternity ward. An eight-year retrospective audit of uterine rupture was made in this hospital, Tigray Region, Ethiopia. A structured questionnaire was used to collect patient information. The questionnaire was filled by one independent physician working in the hospital and it contained the following main categories of variables: socio-demography, history and physical examination finding during admission, causes of ruptured uterus,

intraoperative findings, type of surgical intervention and maternal and neonatal outcome. The total number of deliveries in the hospital was retrieved through review of delivery registration books during the study years. Patient cards and operating room registration books were used to review diagnosis of rupture, surgical intervention and treatment outcome. Patients seen from 1 April 1993 to 30 March 2001 were included. The admission and discharge registration books were reviewed to retrieve the total number of obstetric maternal deaths and their possible causes during the study period.

The following definitions were used to classify diagnosis of cases:

1. Spontaneous uterine rupture was defined as rupture without any iatrogenic manipulation, trauma or oxytocic drugs use or without any previous scar on the uterus.
2. Traumatic rupture was defined as rupture following obstetric manipulation, violence/trauma or use of oxytocic drugs.
3. Incomplete uterine rupture was defined as the separation of the uterine wall without extension through the entire thickness and its peritoneal cover.
4. Complete uterine rupture was defined when the whole uterine thickness including the peritoneal cover was involved.
5. Patients were said to have antenatal care if they had visited a health institution at least once during their prenatal period.
6. Grand multipara was defined as five or more previous deliveries after 28 completed weeks of gestation.

The data were entered, cleared and analyzed using the EPI INFO 5.0 statistical package.

### Results

Between 1 April 1993 and 30 March 2001, 54 cases of uterine rupture were registered in Adigrat Zonal Hospital. All the cards were retrieved. During the same period, there were 5,980 hospital deliveries including 525 caesarean deliveries. The frequency of uterine rupture was 1:110 hospital deliveries.

Age of cases ranged from 18 to 45 years (mean 31.56 year) and Mean parity was 4.8 (range 0 to 14). Sixty-three percent of cases were in 25 to 35 year age group, 94.4% were multipara, and 54.9 % of these were grand multipara. There were three nuliparous cases (5.6%), which followed pitocin use, myomectomy and placenta percreta.

Most cases were from rural areas (85.4%) and only 17% had antenatal care. The mean duration of labor for all cases of ruptured uterus was 58.7 hours, and for women who died 79.6 hours. Fifty-one (95.4%) presented with signs of rupture at admission while 3 (5.6%) ruptured after admission in the hospital. Cephalopelvic disproportion was the cause in 53.7% of the cases. Malpresentation and malposition were responsible for 25.9% of the cases. Instrumental deliveries and previous history of uterine scar were associated incidents with uterine rupture in 3.7 % and 11.2% respectively. Use of pitocin and placenta percreta were the causes in 3.7% and 1.8% of cases respectively (Table 1).

**Table 1: The causes of obstetric uterine rupture in Adigrat Zonal Hospital, 1993-2001**

Causes	Number (%)
Spontaneous	
Cephalopelvic disproportion	29(53.7)
Malpresentation and malposition	14(25.9)
Traumatic	
Forceps	2(3.7)
Pitocin induced	2(3.7)
Previous uterine scar	
Classical	1(1.8)
Luscs	4(7.4)
Myomectomy	1(1.8)
Placenta percreta	1(1.8)
<b>Total</b>	<b>54</b>

Presenting features include: acute abdominal pain in 48 (88.9%), tachycardia in 38 (70.4%), hypotension in 26 (48.1%), coma in 2 (3.7%), vaginal bleeding in 22 (40.7%), palpable fetal parts in 27 (50%), abdominal tenderness in 45 (83.3%), sepsis in 10 (18.5%) and shock in 22 (40.7%) (Table 2).

The mean hemoglobin level at admission was 9.5 gm/dl. Sixty eight percent of cases had a hemoglobin level of 10 grams/dl or below. Diagnosis was made based on signs and symptoms in 35 (64.8%). In 5 (9.3%) cases diagnosis was made by bi-manual exploration of the uterus before laparotomy. In fourteen patients (25.8%) uterine rupture was identified at laparotomy. The indication for laparotomy was ruptured uterus in 40 (74.1%) and obstructed labor in 14 (25.9%).

**Table 2: Presenting features of uterine rupture cases in Adigrat Zonal Hospital, 1993-2001**

Presenting features	Frequency (%)
Abdominal pain	48 (88.9)
Vaginal bleeding	22 (40.7)
Tachycardia	38 (70.4)
Hypotension	26 (48.1)
Palpable fetal parts	27 (50.0)
Sepsis	10 (18.3)
Shock	22 (40.7)
Coma	2 (3.70)

Rupture was complete in 44 (81.5%) and incomplete in 10 (18.5%) of cases. The most common site of rupture was the lower segment of the uterus in 31 (57.4%) followed by the left lateral 13 (24.1%), posterior 4 (7.4%), upper segment 3 (5.6%) and right lateral 3 (5.6%). There were 10 (18.5%) cases with bladder rupture and all had rupture at the lower uterine segment. Three cases with fundal uterine rupture had a history of previous scar (myomectomy and classical caesarean section) and placenta percreta (Table 3).

**Table 3: Site of rupture on the uterus in Adigrat Zonal Hospital, 1993-2001**

Site of rupture	Number (%)
Lower segment	31 (57.4)
Left lateral segment	13 (24.0)
Upper segment	3 (5.60)
Posterior segment	4 (7.40)
Right lateral segment	3 (5.60)
<b>Total</b>	<b>54</b>

Twenty cases (37%) had total abdominal hysterectomy. Repair with or without bilateral tubal ligation (7 with, 14 without) was done in 21 (38.9%) cases. Of the cases 13 (24.1%) had subtotal abdominal hysterectomy. Blood

transfusion was given to 32 (59.3%) cases. Most patients (83.3%) were given one or more antibiotics.

Postoperatively, out of the total patients cured 8 (16.7%) had wound infection, 6 (12.5%) vesicovaginal fistula, 5 (10.4%) urinary tract infection and 2 (4.2%) pneumonia. There were 6 maternal deaths (11.1%) and 53 fetal deaths (98.1%). During the same study period, there were 25 total direct obstetrics maternal deaths in the hospital. Maternal death due to uterine rupture was therefore responsible for 24% of obstetric maternal deaths.

### Discussion

Ruptured uterus is a common obstetric hazard in under developed countries. Many hospital-based studies in developing countries show a very wide variability of rupture among deliveries attended (10-12,14,15). There is a wide gap on the ratio of ruptured cases to deliveries attended between our study and a previous report from a hospital-based study in Ethiopia. The ratio difference might be due to differences in delivery service coverage, number of pregnant women near hospitals and other factors affecting health service use. Since most victims are usually women from rural areas, the ratio of rupture to delivery attendance is not a good indicator for comparison of different localities.

Similar to other studies from developing countries, in our study the most common causes were cephalopelvic disproportion, malpresentation and malposition. Multiparity, lack of antenatal care and rural residence were common factors found among the cases. The mean duration of labor was by far greater among women who died as compared to those who survived. The study revealed that most uterine rupture cases were as a result of obstructed labor. The problem might be exacerbated by poor access to health care services, delayed referral and poor transportation facilities (9-12,16,17).

The common presenting features of cases at admission in our study were consistent with other studies (7). However, a quarter of uterine

rupture cases were missed and diagnosis was made during laparotomy. This shows that presentation can be vague and diagnosis depends on high degree of suspicion and awareness. One must constantly be considering the total clinical picture, and lack of vaginal bleeding should not make one consider any less the diagnosis of ruptured uterus. The uterus should be explored manually after delivery in cases with a risk of uterine rupture such as uterine surgeries when the endometrial cavity was entered or difficult instrumental deliveries.

Similar to other studies, the majority in our study had complete uterine rupture and the commonest sites were the lower and left lateral uterine segments. All the three cases with fundal uterine rupture had either previous scar or placenta percreta. Bladder rupture was exclusively associated with cases with rupture of lower uterine segment (2, 11, 18-20).

The type of surgical intervention depended on various factors. When the patient was in hypovolemic or septic shock, there was clean lower uterine segment rupture simulating lower uterine segment caesarean section and unexperienced surgeon repair or sub-total hysterectomy was preferred. The availability of blood for transfusion and the wish for the future child bearing capability were also important factors to determine the decision. Total abdominal hysterectomy was preferred in the hands of experienced surgeon, relatively reassuring maternal condition and when adequate resuscitative measures were taken. Other authors have also reported different modes of management depending on these factors (10,12,15). Most lost their childbearing capability because of surgical intervention. In the context of Ethiopian culture, a sterile woman can face long-term social and economic problems. In our hospital and studies done elsewhere, vesicovaginal fistula, post-operative wound infection and urinary tract infection were the commonest immediate causes of maternal morbidities associated with rupture of the uterus.

Ruptured uterus is associated with high maternal mortality, maternal morbidity, and

perinatal mortality (2,8-10,12-16). Similar to observations from other authors, the maternal case fatality rate was high (11.1%). On the other hand, fetal mortality rate was found to be relatively higher than in previous reports in which fetal mortality rate ranged from 32.2% to 86.3% (6,10,12, 14-16, 21).

The high maternal morbidity, maternal mortality and fetal mortality that follow uterine rupture calls for an integrated effort to prevent its causes. Good ANC, Family planning services, prompt referral of obstructed labor, availability of transportation and obstetric care are the essential factors to prevent uterine rupture and to decrease the maternal mortality, fetal mortality and maternal morbidity associated with it.

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