

## RUPTURED UTERUS: STILL AN UGLY TRUTH OF MATERNAL MORTALITY IN A TERTIARY CARE CENTRE, BANGLADESH

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### Summary

*This prospective observational study was carried out in the Department of Obstetrics & Gynecology, Chittagong Medical College Hospital from May 2002 to April 2003. The objective of the study was to evaluate various aspects of ruptured uterus regarding etiology, identification of risk factors, types of surgery carried out, maternal mortalities & morbidities and fetal outcome. During the period, out of total 9643 hospital deliveries, 70 cases of ruptured uterus were admitted. This gives an incidence of ruptured uterus 1 in 137 deliveries. Most of the women ranged between 20-29 years of age, while almost all of them were multiparous with mean parity of 5.5. There were only 2 cases in primi gravida, 81% patient was not on any antenatal care. Most of them (81%) were illiterate and from low socioeconomic (87%) group of the community. The common etiological risk factors were Cephalo pelvic disproportion (67%) Shoulder presentation (21%) Abuse of oxytocic drugs (10%) Previous caesarean scar (16%) and Malhandling by dai (42%). Most of the patients gave the history of prolonged labor for more than 24 hours. Shock and sepsis were the prominent presenting features. In most cases, the rupture site was on the lower segment (51%) and in 78% cases, the tear was complete. Out of 68 patients, 33(48%) underwent subtotal hysterectomy, 19(31%) had repair and 14(20.5%) patient undergone total hysterectomy. (2.8%) patients expired after arrival at the hospital before any surgical intervention could be done. Out of 70 patients, 7 patients died giving the mortality rate 10%. The fetal mortality rate was 87%. Uterine rupture still remains one of the major causes of maternal and*

*newborn morbidity and mortality in Bangladesh. Promotion of skilled attendance at birth, use of family planning among those at high risk, avoiding injudicious use of oxytocics during labor, correct use of Partograph and preventing unnecessary c-sections are essential in reducing the occurrence of uterine rupture.*

### Key words

Ruptured uterus; Maternal morbidity; Obstetric fistula; Prolong labor; Previous caesarean section; Fetal outcome.

### Introduction

Rupture of pregnant uterus is a serious obstetric complication and a major cause of maternal death in developing countries. In advanced countries of world, only a few isolated cases are rarely seen now a days.

The term 'Uterine Rupture' is used for anything in a continuum of events, from a weak spot in the uterine wall noticed by surgeon at the time of caesarean section, to the catastrophe of the uterus tearing open and the fetus, placenta and lots of blood extruding into mother's abdomen [1].

Although uterine rupture was a common occurrence in the 18<sup>th</sup> century, William Smellie was the first to notice a rent in the uterus in vivo. Ames and Meredith some 80 years later stated that "This serious and tragic obstetrical emergency was threatening to the life of both mother and child" [2]. The frequency of its occurrence varies widely in different places depending on the quality of obstetric services in region or country.

A simple etiologic classification of parturient uterine ruptures would include spontaneous rupture of the intact uterus, rupture of previous caesarean section scar and traumatic rupture of intact uterus as was initially stated by Garnet [3]. Spontaneous rupture of the intact uterus is especially prone to occur in woman of high parity, particularly when associated with disproportion or malpresentation and or from injudicious use of oxytocic drugs for induction or augmentation of labor [4].

Vaginal Birth After Caesarean Section (VBAC) is common in Western countries. In an American study, uterine rupture occurred in approximately 1 in 67-500 women with one prior c-section who had undergone a trial of labor [1].

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So, the common risk factors causing rupture of uterus are grand multiparity, undiagnosed fetopelvic disproportion, malpresentation, previous history of c-section and oxytocic stimulation.

The maternal and fetal mortality rates are still extremely high in developing countries. WHO's maternal health and safe motherhood program showed that about half a million women die each year globally, due to pregnancy related causes and more than 90% of these deaths occur in developing countries [5].

In most Asian countries, maternal deaths constitute 20%-45% of all deaths in reproductive age group compared to hardly 1% or of less similar deaths Japan or Sweden [6]. The current level of maternal mortality rate in Bangladesh is 1.7/1000 live births [7]. One of the significant causes of this maternal mortality is ruptured uterus.

In Bangladesh, rupture of the uterus is still one of the common obstetric complications and a significant cause of maternal and fetal death. Many factors are responsible for the frequency of its occurrence among Bangladeshi women. These are usually high parity, lack of antenatal care and improper intrapartum management among the affected women.

Rupture of uterus is a preventable obstetric complication. Though tremendous advances in obstetrical services have taken place in Western countries, rupture of uterus still continues to threaten the wellbeing of both mother and fetuses with high morbidities and mortalities in the under developed world. It is now established that almost all the cases of uterine rupture can be avoided by good obstetric assessment and management [4].

The present study aims to evaluate the etiology, clinical presentations, laparotomy findings and the outcome with various modalities of treatment of the patients who were admitted in the Chittagong Medical College Hospital from May 2002 to April 2003. This is a hospital based study and will not represent the whole situation in the country but will give some insight into the causes and management of this catastrophe of laboring women.

#### **Materials and methods**

This prospective observational study was carried out at the Department of Obstetrics and Gynaecology, Chittagong Medical College Hospital from May 2002 to April 2003. A total

number of 9643 obstetric patients were admitted during this period, among them 70 patients were ruptured uterus cases. Important parameters such as age, parity, socio economic conditions, habitation, antenatal care, clinical presentation, findings at laparotomy, types of surgical procedure undertaken, maternal mortalities and morbidities, fetal outcome were recorded on a data collection sheet. Information's were collected from the admitted patients, their attendants and hospital records during the period and enter into a preset protocol. The data was compiled and then analyzed by using simple statistical methods. Long term follow up of mothers & babies could not be done in this study.

#### **Results**

Total number of 9643 obstetric patients were admitted from 1st May 2002 to 30th April 2003 in the Department of Obstetrics & Gynaecology, Chittagong Medical College Hospital. Among them, 70 patients were ruptured uterus cases. The results were tabulated in the following ways :

The table 1 showed that the peak incidence was between 20-29 years of age group (58.5%), 77.7% ruptured uterus occurred in multigravid women – only 2 occurred in primi. Regarding social status, most of the patients (87.1%) were from poor background , no rich woman was recorded as a victim in this series, 82.9% of 70 cases came from rural areas, only 17.1% were urban women.

Table II shows maximum patient (81.43%) unbooked case, most patient (70%) came within 24 hrs of labour, only 10 % patient used oxytocin before admission, 7% of patient attempted assisted delivery before head. General condition of the patient at the time of admission (n=70). Out of 70 cases, patient came with reversible shock were 22 (32.80%), 4 patients were in irreversible shock. There were also associated sepsis in 20 (28.50%) cases.

Both upper and lower segments were often torn and extension into broad ligament with formation of a large hematoma were quite common. Complete rupture occurred in 53 cases and 15 cases had incomplete rupture. Of these 7 were through previous caesarean scar extensive rupture laterally involving upper and lower segments with frequent extension into cervix and vagina and broad ligament were in 3 cases. There was only 1 case of rupture on posterior wall. The site and type of rupture remained unknown in 2 unoperated case.

Here it is evident that cephalopelvic disproportion (32.5%), neglected transverse lie with hand prolapse (17.1%), malhandling by untrained dai (42.8%) were the main responsible factors. 16 cases of ruptured uterus associated with previous caesarean scar giving the percentage 22.8%. Grandmultiparity was also an important factor. Injudicious use of Oxytocin outside the hospital causes rupture uterus in 3 (4.2%) cases. Surgical procedure carried out (n=7). Parity, operative findings and general condition of the patient play important role for operative procedure. Subtotal hysterectomy was performed in majority of cases (48.52%). Total hysterectomy was done in 14 (20.58%). 19 (27.94%) patient underwent repair of rupture, of which most were incomplete rupture, rupture of previous scar. In 2 cases, no surgical intervention were possible before the patient died.

Regarding maternal morbidities, sepsis was the most common cause. Out of 70 cases, 7 (10%) of them died from ruptured uterus, 2(2.8%) of them died before operation. Shock from primary hemorrhage with inadequate replacement of blood was the most frequent cause of death (57.1%), while (42.8%) died from septicemic shock.

**Table I :** The sociodemographic characteristics (n=70)

Age group (Years)	Parity	Socioeconomic condition	Residence
<20 (2.8%)	0 (2.8%)	Poor (87.1%)	Rural (82.9%)
20-29 (58.5%)	1-4 (77.1%)	Middle class (12.9%)	Urban (17.1%)
30-39 (34.2%)	5-7 (20.0%)	Rich (0%)	
40 and >(5.7%)			

**Table II :** Patients Obstetrics characteristics (n=70)

Antenatal care	Duration of labour	Use of oxytocin	Attempted assisted delivery
Unbooked	81.43%	24hrs	70.00%
Booked (Irregular)	8.57%	24-48hrs	22.80%
Booked (Regular)	00.00%	48-72hrs	02.85%
	>72hrs	04.28%	

**Table III :** Laparotomy Findings (n=70)

Per operative findings	No of patients (n=68)	Percent
Type of rupture		
Complete	53	77.90%
Incomplete	15	22.00%
Site of rupture		
Anterior wall lower segment	32	47.0%
Anterolateral wall (L shaped)	17	25%
Posterior wall lower segment	1	1.40%
Upper segment only through Fundus	1	1.40%
Lateral wall (Upper & lower segment with frequent extension to cervix & vagina)	3	4.40%
Extension to bladder	3	4.40%

**Table IV :** The etiological factors responsible for ruptured uterus (n=70)

Nature of rupture	Causes	No of cases	Percent	
Rupture in spontaneous labor of unscarred uterus	Disproportion (due to contracted pelvis)	23	32.8%	
	Transverse lie with hand prolapsed	12	17.1%	
	Hydrocephalus	02	2.8%	
	Shoulder presentation	03	4.2%	
	Occipito posterior position	06	8.5%	
	Breech	06	8.5%	
	Face	02	2.8%	
	Grandmulti parity	16	22.8%	
	Rupture in induced labor of unscarred uterus	Malhandling by dai	30	42.8%
		Craniotomy	01	1.4%
Oxytocin induction		03	4.2%	
Rupture of scarred uterus during pregnancy	Classical /LSCS scar / Hysterotomy	00	0	
	Spontaneous rupture of scarred uterus during labor	00	02.85%	

**Table V :** Fetomaternal Outcome

Maternal morbidities	Maternal mortalities (n=7)	Causes of Maternal mortalities	Foetal outcome
Fever (36.5%)	Unoperated (2.8%)	Shock with primary hemorrhage (57.1%)	Asphyxiated (12.8%)
Shock (34.9%)	Operated (7.1%)	Peritonitis with shock (42.8%)	Fresh stillbirth (78.5%)
Abdominal distension (31.7%)	Total (10%)		Macerated (8.5%)
Peritonitis (23.7%)			Perinatal mortality (87.1%)
UTI (10%)			
Wound infection requiring Secondary suture (12.6%)			
Burst abdomen (4.7%)			
ARF (3.1%)			
Malaria (1.5%)			

### Discussion

Rupture of the gravid uterus is a life threatening complication of pregnancy. In the developed countries, where the level of obstetric care is adequate at all levels, its occurrence is rare. Unfortunately, the same cannot be said regarding countries where poverty, ignorance, illiteracy traditional practices and high parity make this serious complication a common occurrence [8].

In Chittagong Medical College Hospital, total number of rupture of uterus cases were 70 and total admitted obstetric cases were 9643, which gives an incidence of 1 in 137 deliveries. The highest incidence so far reported was 1 in 38 deliveries in Ethiopia, while the lowest has been 1 in 16,849 in USA [9,10]. High incidence of rupture uterus cases admitted in Chittagong Medical College Hospital was because of only referral hospital in this greater region. Exact incidence of the condition is difficult to calculate in Bangladesh because of lack of countrywide statistical data.

The statistical data of Chittagong Medical College Hospital from 2010-2015 was:-

Year	Total Obs Admission	Total rupture uterus	Outcome	Incidence
2010	15810	74	Repair-43 Hysterectomy-2 Death-5	0.47%6
2011	16334	112	Repair-60 Hysterectomy-43 Death-9	0.69%
2012	15862	108	Repair-63 Hysterectomy-43 Death-2	0.68%
2013	15579	109	Repair-77 Hysterectomy-29 Death-3	0.70%
2014	18803	95	Repair-59 Hysterectomy-32 Death-4	0.51%
2015	19631	67	Repair-46 Hysterectomy-12 Death-9 Death	0.34%

The high incidence of ruptured uterus has been attributed to poor antenatal and ineffective intranatal care. In this study, only 13(18.6%) patients had antenatal care, that is 81.4% was lacking in antenatal care. Megafu in Nigeria observed that 96.2% of the cases of ruptured uterus and Rahman in Libya observed that 95% of his cases of ruptured uterus lacked prenatal care [11,12].

Multiparity is generally recognized as an important risk factor in the etiology of the ruptured uterus. This study showed that rupture uterus occur in grand multiparity (20%) (Table I). In Megafu's study from Nigeria 65.2% of the women were of parity 2 and above and similar findings have also been reported by others (Gohlen, Rahman) [11,13].

There were 2 cases of ruptured uterus in primigravida. One case was due to injudicious administration of oxytocin outside the hospital. Another case was due to malhandling by untrained dai in remote rural areas. It was also observed from the present study that socioeconomic background played a vital role in the incidence of ruptured uterus. Most of the patients 61 (87%) were from poor class and 9 (13%) from middle class and none from rich family (Table I). Previous caesarean section is the most important predisposing factor for the occurrence of uterine rupture [14]. In this series, 16 (22.8%) cases were previous history of caesarean section (Table III). Yet other reports have demonstrated no difference in the outcome of labour between with and those without previous caesarean section with regard to rupture of the uterus [15]. Cephalopelvic disproportion (67.14%) and transverse lie with hand prolapse (17.14%) were the most frequent causes of ruptured uterus in present study, which is almost similar that reported by A. Begum from Dhaka Medical College Hospital, Bangladesh. Chen in Singapore showed that ratio of the cases with scarred uterus against those with unscarred uterus was 3:1 [16]. The commonest antecedent factor was previous lower segment caesarean section. Most of the patients were exposed to more than one factor. Shock and septicemia were a prominent feature in majority of cases. Out of 70 cases. 26 patients (38%) were in shock and 20(28.6%) had infection. The lower segment was the commonest

site of the rupture in the present series (Table III), which is reported by Konje and also similar to findings in most other studies [17]. Anterior ruptures were more than 3 times as common as lateral and posterior rupture combined (Table III) [17]. This may be explained by the fact that most of the ruptures were those of lower scars. In this study, 53(77.9%) cases were complete rupture and 15 (22%) cases were incomplete rupture (Table III). This is contrary to the study of Konje where incomplete rupture (53.2%) was more common than complete rupture (46.8%) [8].

In present series, out of 68 patients, 19 (27.9%) had undergone repair, 2 (2.9%) had repair with bilateral tubectomy and 33 (48.5%) had sub-total hysterectomy and 14(20.5%) had total hysterectomy. Though total hysterectomy should be done ,whenever possible, yet in the present series, subtotal hysterectomy was done in most cases (48.52%) which was due to low general condition which allowed the shortest possible operating time.

In this series, there was very high fetal mortality (87%), only 9 fetuses survived from a scarred ruptured uterus (Table V). A Hossain showed that the perinatal mortality was 84.4% [18].

In this study, 7 patients out of 70 cases of ruptured uterus, died giving a mortality rate of 10% (Table V). This rate is really high. In fact, reports from other developing countries give a similar high mortality rate. Megafu reported maternal mortality rate 41.6% from Nigeria while Nagarkatti reported a mortality rate of 18.7% from India [11,19].

Paralytic ileus and sepsis were the main post operative complication in the present series. The other complications were acute renal failure, shock, fever and urinary tract infection. Interference outside the hospital, malnutrition, anaemia, dehydration and a low general condition of the patient at the time of admission were probably the responsible factors for development of the sepsis. Rupture of the uterus is one of the most serious complication associated with the pregnant women that may even end in life [20].

### Conclusion

Rupture of the gravid uterus is still a common obstetric tragedy in Bangladesh and one of the major causes of maternal and newborn morbidity and mortality. Many patients arrive in hospital after long neglected labors. A high incidence (1 in 137) of ruptured uterus cases were mainly because of inadequate antenatal and intranatal care, high parity, mismanagement done by midwives and Traditional Birth Attendants (TBA). Low socioeconomic condition, illiteracy and lack of knowledge of people are the contributory factors in causing the complication.

Thus, high maternal and foetal mortality rates can be reduced by providing health education, community based maternity care, making EOC (Emergency Obstetric Care) services available at all levels, establishment of first referral health centers with adequate facilities. Easy access to family planning services and also skillful training of health service providers will definitely help in changing the situation.

### Disclosure

All the authors declared no competing interest.

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