Original Article

Obstetrical Catastrophe: Ruptured Uterus- Incidence, Risk Factors, Fetomaternal Outcome and Management in Ad-Din Women's Medical College and Hospital, Dhaka, Bangladesh

Rahima Khatun[1], Sabiha Sultana[2], Nasima Begum[3], Nilufar Jahan[4], Banika Biswas[5], Shahnaz Akhter[6]

Abstract

Background: A ruptured uterus is a catastrophic condition. It is associated with a high incidence of fetal and maternal mortality and morbidity.

Objective: To determine the incidence, risk factors, maternal and fetal outcome, and management of uterine rupture in Ad-din Women's Medical College and Hospital, Dhaka, Bangladesh.

Materials and Methods: This prospective observational study of patients with ruptured uterus from July 2022 to June 2023 admitted at Gynaecology and Obstetrics department of Ad-din Women's Medical College and Hospital, Dhaka. All the cases of ruptured uterus who were either admitted with ruptured uterus or who developed it in hospital were included in the study. Patients were initially assessed in emergency and labor wards, and relevant sociodemographic data, obstetric history, and previous antenatal and surgical history were recorded. Ways of management, and maternal and fetal outcomes were taken for analysis.

Results: There were 45 cases of ruptured uterus out of a total of 17,288 deliveries over one year with a prevalence of 0.26%. The most common age group was 30-35 years, and most of the patients 37(82.2%) had a history of previous cesarean section. A maximum of 24 (53.3%) rupture of the uterus was found >36-40 weeks. Subtotal hysterectomy was done in 4 (8.9%) patients, and Subtotal hysterectomy with the repair of the bladder was done in 2 (4.4%) patients, out of 45 patients, 4 (8.9%) patients developed acute renal failure and maternal death was found 4 (8.9%) patients. IUFD was found in 21 (46.7%) babies, 10 (22.2%) babies needed NICU and neonatal death was found in 4 (8.9%) babies.

Conclusion: Uterine rupture is a preventable obstetric complication that carries severe risks both to the mother and to the baby. Proper antenatal care, appropriate counseling of patients with a history of previous caesarian section for hospital delivery, and training of skilled birth attendants can reduce maternal and perinatal mortality and morbidity due to ruptured uterus.

Keywords: Uterine rupture, risk factors, maternal and fetal outcomes, management, caesarian section

1. Associate Professor, Department of Obstetrics and Gynaecology, Ad-din Women's Medical College and Hospital
2. Associate Professor, Department of Obstetrics and Gynaecology, Shaheed Monsur Ali Medical College and Hospital
3. Associate Professor, Department of Obstetrics and Gynaecology, Enam Medical College and Hospital
4. Assistant Professor, Department of Obstetrics and Gynaecology, Ad-din Women's Medical College and Hospital
5. Associate Professor, Department of Obstetrics and Gynaecology, Ad-din Women's Medical College and Hospital
6. Associate Professor, Department of Obstetrics and Gynaecology, Ad-din Women's Medical College and Hospital

Correspondence: Rahima Khatun, Associate Professor, Department of Obstetrics and Gynaecology, Ad-din Women's Medical College and Hospital. Email: anisdoc14@yahoo.com, Mobile no: 01712721383

Received Date : 3 March, 2024
Accepted Date : 18 March, 2024

Introduction

Disruption in the continuity of all uterine layers (endometrium, myometrium, and serosa) any time beyond 28 weeks of pregnancy is called a rupture of the uterus. Whereas improved obstetrics care reduces the rupture from obstructed labor there has been an increased prevalence of scar rupture following increased incidence of caesarian section over the year[1].

Uterine rupture is an obstetric catastrophe sometimes leading to tragic maternal and fetal outcomes. It is complete when a full-thickness disruption of the uterine visceral peritoneum and incomplete when the disruption does not involve the overlying visceral peritoneum[2].

The incidence of uterine rupture in developed countries is low due to the availability and access to quality

The Journal of Ad-din Women's Medical College; Vol. 12 (2), July 2024; p 5-10
https://doi.org/10.3329/jawmc.v12i2.79199

obstetric services, most cases occur in women with uterine scar following previous cesarean section[3,4]. Incidence of between 0.36% to 2.44% were reported in Nigeria, Ethiopia, Pakistan, Senegal and Mali [5,6,7,8,9]. However, the major causes of uterine rupture in developing countries are obstetric and non-obstetric multiple factors such as; multi-gravidity, teen-age pregnancy, old primipara mother, poor socio-economic status, previous caesarian section scar, unsupervised labor and unwise use of uterotonic agents[10].

The signs and symptoms of uterine rupture, largely depend on timing, site, extent of uterine defect, severe hemorrhage, easily palpable fetal parts, the recession of presenting fetal parts, loss of uterine contour contractility, and rarely blood-stained urine, the appearance of placenta at the vulva and prolapsed of loops of gut into the vagina[11]. The documented fetal complications are neonatal intensive care unit (NICU) admission, fetal hypoxia, and neonatal death[8,12]. Maternal consequences include hemorrhage, bladder injury, hypovolemic shock, vesicovaginal fistula(VVF), permanent loss of fertility, and even maternal death[13].

The type of surgical treatment is dependent on the severity and extent of the rupture, hemodynamic status of the mother, future fertility desire, and surgeon experience. The available options include total abdominal hysterectomy (TAH) or subtotal abdominal hysterectomy (STAH), repair of the uterus with or without tubal ligation[14,15]. Uterine repair is usually reserved for those cases with lower segment rupture, without broad ligament, vaginal lower segment and cervical extension, haemo-dynamically stable condition, controllable hemorrhage, and young patients desiring future fertility. Hysterectomy is justified for hemo-dynamically unstable patients, unrepeatable rupture, and where fertility is not desired[16].

Material and methods

A prospective observational study was conducted from July 2022 to June 2023 at the Gynecology and Obstetrics Department of Ad-din Women's Medical College and Hospital. It is a tertiary-level hospital where emergency obstetric surgery is performed. During this period total of 17,288 patients were admitted to the hospital for delivery purposes and 45-50 deliveries were being conducted daily. The data was collected from the labor ward and operation theatre registers book as well as from the patient's case files in the hospital medical records files.

During this period, 45 patients having ruptured uterus, mostly referred and a few delivered in hospital were studied. Patients were initially assessed in the emergency and labor wards, and relevant sociodemographic data, obstetric history, period of gestation, and previous uterine scar were recorded. The site of rupture, type of surgery, unit of blood transfusion, and maternal and fetal outcome were also recorded.

Result

This study analyzes 45 cases of ruptured uterus documented over 12 months from July 2022 to June 2023. During this timeframe, 17,288 deliveries were recorded. The incidence of ruptured uterus in this population was found to be 0.26%.

Table 1: Socio-demographic factors

Factor	No of patients (45)	Percentage %
Age (in years)		
16 to 19	0	0
20 to 29	18	40%
30 to 35	23	51.1%
35+	4	8.9%
Parity		
Para-1	15	33.3%
Para-2	25	55.6%
Para-3 or more	5	11.1%
Antenatal care		
Regular	17	37.8%
Irregular	28	62.2%

The socio-demographic distribution of participants is illustrated in Table 1. Notably, the majority of patients were between the ages of 20 and 35 years. Specifically, 40% (18) were aged 20 to 30 years, while 51.1% (23) were in the 30 to 35 years category. A smaller proportion, 8.9% (4), were aged 35+ years. No patients were recorded in the 16 to 20 years age group. The majority of the patients (25) have two children, and most of the patients 28 (62.2%) had irregular antenatal checkups whereas only 17 maintained regular checkups.

Table 2: Causes of Ruptured Uterus

Risk factor	No of patients	Percentage %
Obstructed labor	3	6.7%
Injudicious use of oxytocin	5	11.1%
Silent scar dehiscence	37	82.2%

The result of the causes of uterine rupture in this study revealed that silent scar dehiscence was the most significant risk factor, identified in 37 patients (82.2%). Induction of labor was done in only 5 patients.

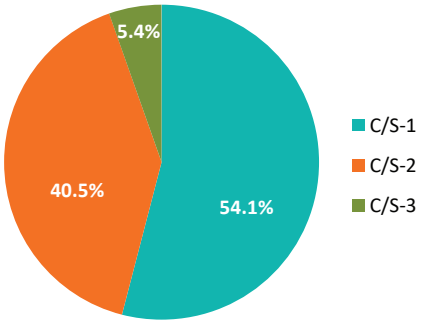

Figure 1: History of C/S

Figure 1 Shows that 20 patients (54.05%) had a history of previous C/S-1, and only 2 (5.4%) of cases had a history of previous C/S -3 or more where 15(40.5%) of the patients had a history of C/S-2.

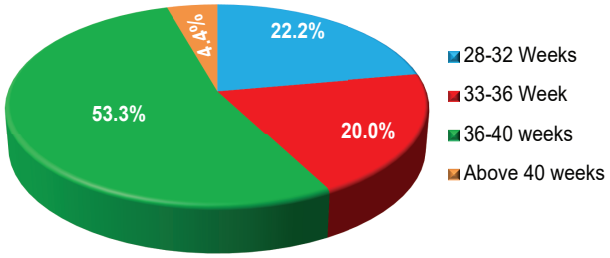

Figure 2: Gestational Age

Figure 2 shows that the maximum 24 (53%) rupture of the uterus was found in 36-40 weeks of gestation. Among them, only 2(4%) ruptures of the uterus were found above 40 weeks of gestation. Two age groups 28-32 weeks and 33-36 weeks show nearly the same distribution for the raptured uterus with 22% and 20% of the patients respectively.

Table 3: Per–operative findings

Findings	No of patients	Percentage %
Hemoperitoneum		
Present	26	57.8%
Absent	19	42.2%
Site of rupture		
Scar rupture	8	17.8%
Rupture of the lower segment	17	37.8%
Extension to upper segment	12	26.7%
Extension up to the broad ligament	2	4.4%
Injury to the urinary bladder	4	8.9%
Not explored due to death	2	4.4%

In this study, hemoperitoneum was found in 26 (57.8%) cases, rupture of the lower segment was found in 17 (37.8%) cases, extension to the upper segment was found in 12 (26.7%) cases, Injury to the urinary bladder was found 4 (8.9%) cases.

Table 4: Management during operation

Surgical management	No of patients	Percentage (%)
Repair of uterus	25	55.6%
Repair of the uterus with tubal ligation	10	22.2%
Subtotal hysterectomy	4	8.9%
Subtotal hysterectomy with repair of bladder	2	4.4%
Repair of uterus with repair of bladder and tubal ligation	2	4.4%
Not done due to cardiac arrest and death	2	4.4%

This study showed the repair of the uterus was done in 25 (55.6%) patients, a hysterectomy was done in 4 (8.9%) patients, a Subtotal hysterectomy with repair of the bladder was done in 2 (4.4%) patients, and repair of the uterus with repair of bladder and tubal ligation was done 2 (4.4%) patients. Surgery was not possible due to cardiac arrest and death in 2 (4.4%) patients.

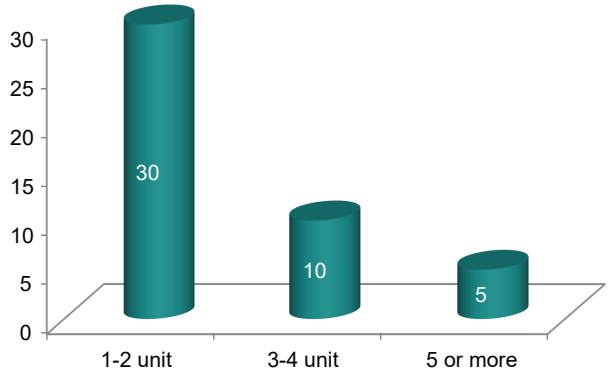

Figure 3: Blood Transfusion During Operation

Figure 3 displays that during the operation 30 patients needed 1-2 units of blood transfusion, 10 patients needed 3-4 units of blood transfusion, and the rest 5 patients needed more than 5 or more units of blood transfusion during operation.

Table 5: Outcome of mother

Maternal outcome	No of patients	Percentage
Needed ICU	17	37.8%
Renal failure	4	8.9%
Death	4	8.9%
Recovery	35	77.8%

We can see from Table 5 that in this study of 45 patients, 17 (37.8%) required admission to the Intensive Care Unit (ICU), indicating significant severity. Four patients (8.9%) experienced renal failure, and there were four maternal deaths, also 8.9%. However, 35 (77.8%) patients achieved full recovery, highlighting the potential for successful outcomes despite serious challenges.

Table 6: Outcome of baby

Fetal outcome	No of patients	Percentage
IUFD	21	46.7%
Needed NICU	10	22.2%
Neonatal death	4	8.9%

Table VI shows that intrauterine fetal death (IUFD) occurred in 21 cases, representing 46.7% of the cohort. Additionally, 10 patients (22.2%) required admission to the Neonatal Intensive Care Unit (NICU). The study also reported four neonatal deaths, accounting for 8.9% of the total.

Discussion

The ruptured uterus remains one of the serious obstetric complications. Lack of health information, illiteracy, poor antenatal care, poverty, home delivery by birth attendants, and delay in referrals all contribute to uterine rupture[17]. The prevalence widely varies from 1 in 2000 to 1 in 200 deliveries[1]. In this case, the prevalence of ruptured uterus is 0.26%.

Most of the patients in this study were 23 (51.1%) between the ages of 30-35 years. This was compared with another study, where most of the women belonged to the age 21- 30 years (30%). The majority of the patients 25 (55.6%) have two children. This research was similar to another study, in which 42.7% were found in para (2-4). Most of the patients 28(62.2%) had irregular antenatal checkups and similar results were found in other studies [18].

This research showed rupture of the previous scar was the most common cause 37(82.2%), induction of labor was done in 5 patients and obstructed labor was found in 3 patients. Another study found that a common etiological factor proved to be the previous caesarian section 75.55% [19]. In our study, most of the patients had a history of 1 C/S 20(54.4%), and 15(40.05%) patients had a history of 2 C/S. A maximum of 24 (53.3%) ruptures of the uterus were found at 36- 40 weeks, which was similar to the investigation done at Faridpur Medical College Hospital, Bangladesh where most of the ruptures occurred at 37-40 weeks 53%[18].

Pre-operative findings, haemoperitoneum was present in 26 cases (57.8%), 19 (43.2%) had rupture of the lower segment, 12 patients (26.7%) had rupture extension to the upper segment, and 4 patients had an injury to the bladder. In this study, 2 patients were not explored as the patients expired during resuscitation. This study showed repair of the uterus was done in 25 patients, subtotal hysterectomy was done in 4 patients, Subtotal hysterectomy with the repair of the bladder was done in 2 patients, and repair of the uterus with the repair of the bladder and tubal ligation was done in 2 patients. A similar situation was observed in India where repair of the uterus was 75.5% [19]. In Nigeria, repair of the uterus was done in 58.3% and hysterectomy was done in 3 patients[20].

During the operation, 30 patients needed (1-2) unit blood transfusion, and 10 patients needed (3-4 unit blood transfusion. Out of 45 patients, 35 patients improved (77.8%), 4 patients developed acute renal failure, and maternal death was found in 4 patients. But, maternal mortality secondary to uterine rupture was lower in this study. A similar result was found in a study where maternal death was 16(6.6%)[21]. The possible explanation for this, is timely diagnosis, adequate resuscitation, availability of blood transfusion, and no delay in between diagnosis and definitive management.

In this study, 2 patients died from hypovolemic shock. IUFD was found in 21 cases, 10 babies were admitted into the NICU, and neonatal death was found in 4 babies. Perinatal death was high in our case, a similar result was in a few other developing countries as well.[22, 23, 24]. The main cause of maternal mortality was failure to diagnose the condition at the first referral center and arrival at the tertiary center in an unstable condition. Perinatal

mortality is due to hypoxia caused by immediate placental separation.

Conclusion

Uterine rupture is a dire emergency with a high incidence of maternal and fetal morbidity and mortality. Lack of proper antenatal care, injudicious use of oxytocin, lack of awareness of hospital delivery in patients with a history of cesarean section, and delay of management are the main causes of ruptured uterus in this research. Early diagnosis, well-equipped Intensive Care Unit (ICU), good blood bank service, and Neonatal Intensive Care Unit (NICU) can help reduce maternal and perinatal mortality secondary to uterine rupture. In addition, hospital delivery, judicious administration of oxytocin, early resuscitation of patients, and timely management are essential to decrease maternal death secondary to uterine rupture.

References

1. Dutta DC. D.C Duttas Textbook of Obstetrics.9th edition. New Central Book Agency Ltd. 2018; 400
2. Gerard G Nahum. Uterine rupture in pregnancy. Medscape Obstetrics and Gynaecology. Available at: http://reference.medscape.com/article/275854 overview. Accessed on 30th January 2020.
3. Hofmeyr Gj, Say L, Gulmezoglu AM. WHO systemic review of maternal mortality and morbidity: the prevalence of uterine rupture. BJOG.2005;112(9); 1221-1228
4. Fitzpatrica KE, Kurinczuk JJ.Alflrevic Z, Spark P, Brocklehurst P, Knight M. Uterine Rupture by intended mode of delivery in the UK: A National case –control study. PLOS Med 2012:9(3): e 1001-184.
5. Omole-Ohonsi A, Attah R. Risk factors for Ruptured uterus in a Developing country. Gynaecol Obstetric. 2011: 1:102
6. Igwegbe AO, Eleje GU,Udegbunum OI. Risk factors and perinatal outcome of uterine rupture in a low resource setting. Niger MedJj.2013:54:415-419
7. Delafield R, Pirkle CM, Dumont A. Predictors of uterine rupture in a large sample of women in Senegal and Mali: cross-sectional analysis of QUARITE trial data. BMC Pregnancy Childbirth. 2018:18:432
8. Astatikie G, Limenih MA, Kebede M. Maternal and fetal outcomes of uterine rupture and factors associated with maternal death secondary to uterine rupture. BMC Pregnancy Childbirth. 2017, April 12:17(1):117
9. Zeb L. Bibi S. Trends in frequency and causes of uterine rupture in a tertiary care center between year 2001 and 2011. J Postgrad Med Inst.2013;27(3): 317-321
10. Rizwan N, Abbasi RM, Uddin SF.Uterine rupture,frequency of cases and fetomaternal outcome. J Pak Med Assoc.2011;61(4):322
11. Khanum Z, Lodhis K-Emergency Obstetric Hysterectomy: a lifesaving procedure. Ann King Edward Medical College2004;10: 292-294
12. Revicky V, Muralidhar A, Mukhopadhyay S, Mahmood T. A case series of uterine rupture: Lessons to be learned for future Clinical Practice. J obstet Gynaecol India. 2012 Dec; 62(6); 665-673.
13. Khooharo Y, Yousfani JZ, Malik SH, Amber A, Majeed N, Malik NH, et al. Incidence and management of rupture uterus in obstructed labour, J Ayub Med Coll. Abbottabad, 2013 Jan- Jun;25(1-2):149-151
14. Kidantou HL, Mwampagatwa I, Van Roosmalen J. uterine rupture: a retrospective analysis of causes, complication and outcomes of Muhimbili National Hospital in Dar es Salam. Tanzania. Tanzan J Health Res. 2012July;14(3):220-225.
15. Berhe Y,Gidey H,Wall LL. Uterine rupture in Mekelle, northern Ethiopia, between 2009 and 2013, Int J Gynaecol Obstet.2015 August;130(2):153-156
16. Zhang Y, Yan J, Han Q,Yang T , Cai L, FuY,et al. Emergency obstetric hysterectomy for life threatening postpartum hemorrhage: A 12- year review. Medicine(Baltimore). 2017bNov; 96(45): e8443.
17. Malik HS. Frequency, predisposing factors and fetomaternal outcome in uterine rupture. J Coll Physician Surg Pak.2006; 16:472-475
18. Mahbuba, IP Alam. Uerine Rupture-Experience of 30 Cases at Faridpur Medical College Hospital. Faridpur Medical Coll .J. 2012; 7(2):79-81

19. Raval BM, Patil AG, Shah PD et al. Uterine rupture: a preventable obstetric catastrophe. Int J Reprod Contracept obstet Gynaecol.2020 Jan;9(1):151-155.

20. Kahamsim ML, Nyango DD, Oyebode TA, Egbodo CO et al. Predisposing factors and outcome of uterine ruture in Jos ,North-central Nigeria. Int J Res Med Sci. 2020 Sep;8(9): 3198-3202

21. Qazi Q,Akhter Z, Khan K, Khan AH. Woman Health ; Uterus Rupture, Its complication and management in Teaching Hospital Bannu, Pakistan.Maedica , A journal of Clinical Medicine 2012,7(1)49-53

22. Sahu L.A 10 years analysis of Uterine rupture at aTeaching institution. J obstet Gynaecol India. 2006; 56(6): 502-506

23. Nausheba R. Razia MA, Syed FU. Uterine rupture, frequency of cases and fetomaternal outcome. J Park Med Assoc.2011;61(4):322-324

24. Dattijo LM,Umar NI, Yussuf BM. Ruptured uterus in Azare, North Eastern Nigeria. Jos J Med. 2011;5(2): 17-20