

STUDY OF CASES OF RUPTURE UTERUS AND ITS MATERNAL AND PERINATAL OUTCOME IN A TERTIARY CARE INSTITUTE

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ABSTRACT Background: Rupture of the pregnant uterus refers to the complete disruption of all uterine layers, including the serosa. It is a life-threatening obstetric emergency and a major cause of maternal and perinatal morbidity and mortality. In India, in advanced setups, the incidence of rupture preceded by obstructed labour is decreasing; in rural parts where there is inadequate care, lack of communication and transport, and home deliveries by untrained dais incidence of rupture uterus is still high. So, the study evaluates the etiological factors, incidence, management modalities and maternal and perinatal outcomes. **Methods:** A hospital-based prospective cross-sectional study of 201 cases of rupture uterus and maternal and Perinatal outcomes was conducted in the department of Obstetrics and Gynecology in the government tertiary reference centre, Kolkata, West Bengal, India, from March 2020 to April 2021. The study included 201 cases of rupture uterus, fulfilling the inclusion criteria. The template was generated in an MS excel sheet, and analysis was done on SPSS software. **Results:** The majority of the patients, 180 (89.55%), have an incomplete rupture, and only 21 (10.45%) have a complete rupture. Regarding treatment done, 64 (31.84%) treated with total hysterectomy, 60 (29.85%) treated with subtotal hysterectomy, 51 (25.37%) treated with repair with BLTL and 26 (12.94%) treated with the repair without BLTL. Of all mothers, 201 (100%) were repeated transfusions followed by Bladder Injury, 18 (8.96%), Wound Sepsis 15 (7.46%). The maximum fetal complication was Perinatal Asphyxia 96 (47.76%), followed by Sepsis 7 (3.48%), and Jaundice 14 (6.97%). **Conclusions:** Uterine rupture is still a major public health problem in developing countries, with a high potential for causing perinatal and maternal morbidity and mortality. Behavioural change strategies should be employed in educating women and their spouse through peer education, group engagement and culturally sensitive and acceptable strategies on the need to attend antenatal clinics and have their deliveries in hospitals equipped with trained and skilled personnel to supervise pregnancy, labour and delivery.

KEYWORDS Maternal mortality, Perinatal mortality, Rupture uterus

Introduction

A uterine rupture is a complete division of all three layers of the uterus: the endometrium (inner epithelial layer), myometrium (smooth muscle layer), and perimetrium (serosal outer surface). Clinicians must remain vigilant for signs and symptoms of uterine rupture. Uterine ruptures can cause serious morbidity and mortality for both the woman and the neonate. Most uterine ruptures occur in pregnant women, though it has been reported in non-pregnant women when the uterus is exposed to trauma,

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infection, or cancer.¹⁻³ Causes of uterine rupture in an unscarred uterus are grand multiparity, injudicious (medically not recommended at this stage but prescribed) use of oxytocin, neglected labour, previous CS and myomectomy, uterine instrumentation and manipulation, labour induction, congenital abnormalities of the uterus and uterine distension due to polyhydramnios, multiple pregnancy and fetal macrosomia. An 8-time increased incidence of uterine rupture, i.e.1 in 920 cases, is seen in developing countries due to cited causes.⁴⁻⁶ Typically, uterine rupture occurs suddenly and requires immediate critical emergency care for mothers, fetuses, or neonates. The strategies for prevention and management and the quality of affordable care for women at risk of or experiencing uterine rupture are likely to vary across settings depending on their diagnostic capacity, availability of obstetric interventions, and human and facility resources. Therefore, the findings in developed countries may not be generalizable to low-resource countries and settings.⁵⁻⁸

Hence, the present retrospective study was undertaken to evaluate uterus rupture among women.

Method and Materials

Type of study

A hospital-based prospective cross-sectional study.

Place of study

Department of Obstetrics and Gynecology, Medical College & Hospital, Kolkata.

Period of study

Patients with spontaneous labour in cases of scarred/unscarred uterus fulfilling the inclusion criteria and willing to participate in the study.

Sample size

201.

Inclusion criteria

1. All patients registered and unregistered clinically suspected to have a ruptured uterus; patients presented with varying degrees of shock, abnormal uterine contour, absent FHS, bleeding per vagina, pain in the abdomen, and hematuria. Patients with spontaneous labour in cases of scarred/unscarred uterus
2. Patients with previous vaginal delivery
3. Cases with previous transverse/vertical lower cesarean /upper segment cesarean section
4. Cases of scarred uterus rupture due to other operations like Myomectomy, hysterotomy, and operations for correcting uterine anomalies.

On admission, initial resuscitative management was done. A detailed history regarding the socio-demographic profile and probable aetiological factors were taken. Emergency investigations were sent, and an emergency laparotomy was done. Obstetrics. Hysterectomy or suturing of the ruptured scar was done depending upon the patient's condition, parity, presence or absence of infection etc.

Previous aspects of rupture uterus, i.e. incidence, aetiology, type of rupture, site of rupture, modalities of treatment, maternal morbidity and mortality and Perinatal mortality, were analyzed and assessed.

Exclusion criteria

1. Cases with scar dehiscence.
2. Cases of direct uterine trauma

Data collection and interpretation

Name, age, registration number, address, and other details related to the study were noted. After selecting patients and taking informed consent, the data was collected in a pre-designed and pre-tested questionnaire.

Statistical analysis

For statistical analysis, data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS (version 27).

Ethical clearance

The study was conducted after obtaining written approval from the Institutional Ethics Committee. Written informed consent will be taken from every study patient or their logical representative.

Results

This hospital-based prospective cross-sectional study of 201 cases of rupture uterus and maternal and Perinatal outcomes was conducted in the Department of Obstetrics and Gynecology in a government tertiary reference centre to evaluate the etiological factors, incidence, and management modalities and maternal and perinatal outcomes.

Table 1 shows that majority of the patients were Hindu 136 (67.66%), followed by Muslim 62 (30.85%). The majority of the patients, 155 (77.11), belong to the age group of 20-34 years, followed by ≥ 35 years 36 (17.91%) and ≤ 19 years were 10 (4.98%). Maximum patients belong to multi parity group, 185 (92.04%), and the rest of 16 (7.96%) belong to primi parity group. Majority 123 (61.19%) patients have completed 2-3 antenatal checkups, 17 (8.46%) have >4 antenatal checkups, and 14 (6.97%) have not completed any antenatal checkups. The mothers' gestation period of 124 (61.69%) was 37-42 weeks. The place of delivery of 147 (73.13%) mothers was medical college, 43 (21.39%) had a place of delivery at a peripheral hospital, and the rest 11 (5.47%) had home delivery.

Table 2 shows that most of the patients, 196 (97.51%), have singleton pregnancies, and only 5 (2.49%) have multi-pregnancy. Regarding the previous history of surgery, 111 (55.22%) patients have LSCS, 8 (3.98%) have classical CS, 7 (3.48%) have myomectomy and 5 (2.49%) have perforation.

Table 3 shows that the majority of the patients, 180 (89.55%), have an incomplete rupture, and only 21 (10.45%) have a complete rupture. Regarding treatment done, 64 (31.84%) were treated with total hysterectomy, 60 (29.85%) treated with subtotal hysterectomy, and 51 (25.37%) treated with repair with BLTL and 26 (12.94%) treated with the repair without BLTL. 115 (57.21%) of the babies weighed 2.5 kg and above and 86 (42.79%) were underweight. In the case of the maternal outcome, 189 (94.03%) mothers were alive, and 12 (5.97%) died. In perinatal outcome 160 (80.60%) were alive, and 39 (19.40%) were died.

Table 4 shows that the Hb level of the majority of mothers, 120 (59.70%) was 7-11, and 81 (40.30%) of mothers had preoperative Hb levels of ≥ 12 . Postoperative Hb levels of the majority of mothers were 140 (69.65%) 7-11, and 47 (23.38%) of mothers had pre-operative Hb levels of > 7 , and 14 (6.97%) mothers had preoperative Hb levels of ≥ 11 .

Table 1 Distribution according to religion, age, parity, ANC Visits, Period of Gestation, place of delivery, and Instrumental Delivery.

Religion	Number	%
Hindu	136	67.66
Muslim	62	30.85
Others	3	1.49
Total	201	100
Age		
≤19	10	4.98
20-34	155	77.11
≥ 35	36	17.91
Parity		
Primi	16	7.96
Multi	185	92.04
No of ANC		
1	38	18.91
2-3	123	61.19
≥ 4	17	8.46
≥ 5	4	1.99
0	14	6.97
Period of Gestation		
<37 weeks	66	32.84
37-42 weeks	124	61.69
>42 weeks	11	5.47
Place of delivery		
Home	11	5.47
Peripheral Hospital	43	21.39
Medical College	147	73.13
Instrumental Delivery	12	5.97

Table 2 Distribution according to Number of pregnancies. Previous H/O Surgery, Inter-delivery Interval after CS, Types of Labour and Mode of Delivery.

Number of pregnancy	Number	%
Singleton	196	97.51
Multi	5	2.49
Previous H/O Surgery		
Classical CS	8	3.98
LSCS	111	55.22
Perforation	5	2.49
Myomectomy	7	3.48
Inter-delivery Interval after CS		
≤12 months	62	30.85
>12 months	137	68.16
Types of Labour		
Spontaneous	135	67.16
Obstructed	31	15.42
Not in Labour	35	17.41
Mode of Delivery		
Vaginal	57	28.36
LSCS	113	56.22
DE	8	3.98
Molar	4	1.99
Ectopic	1	0.50

Table 3 Distribution according to types of rupture, type of treatment, birth weight, maternal and perinatal outcome.

Types of Rupture	Number	%
Complete	21	10.45
Incomplete	180	89.55
Treatment		
Total Hysterectomy	64	31.84
Subtotal Hysterectomy	60	29.85
Repair without BLTL	26	12.94
Repair with BLTL	51	25.37
Birth weight		
<1kg	20	9.95
1-2.5kg	66	32.84
>2.5-3.5kg	95	47.26
>3.5-4kg	20	9.95
Maternal outcome		
Alive	189	94.03
Death	12	5.97
Perinatal outcome		
Alive	162	80.60
Death	39	19.40

Table 4 Distribution according to pre and post-operative Hb%

Pre Operative Hb level	Number	%
7-11	120	59.70
≥ 12	81	40.30
Post-operative Hb level		
<7	47	23.38
7-11	140	69.65
>11	14	6.97

Table 5 Distribution according to Location of uterine rupture, Injury in unscarred uterus and time of rupture.

Location of uterine rupture	Number	%
Lower segment scar dehiscence	94	46.77
Lower segment anterior	27	13.43
Lateral transverse	19	9.45
Lateral longitudinal	14	6.97
Lateral irregular	20	9.95
Posterior longitudinal	8	3.98
Posterior irregular	11	5.47
Fundal	8	3.98
Injury in Unscarred uterus		
Obstructed labour	31	15.42
Head obstruction	16	7.96
Fundal pressure	16	7.96
Forceps	8	3.98
Perforation	7	3.48
Time of rupture		
Antenatal	19	9.45
Intrapartum	182	90.55

Fig 1: Distribution according to Maternal complications

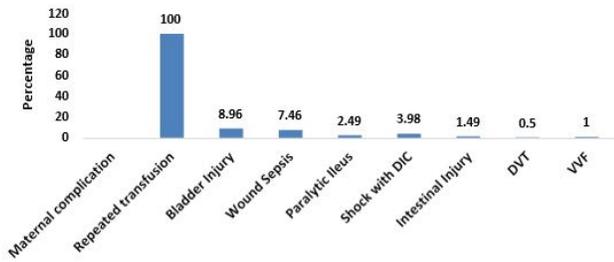


Figure 1 Shows that maternal complications of all mothers 201 (100%) were repeated transfusion followed by Bladder Injury 18 (8.96%), Wound Sepsis 15 (7.46%), Paralytic Ileus 5 (2.49%), Shock with DIC 8 (3.98%), Intestinal Injury 3 (1.49%), DVT 1 (0.50%) and VVF 2 (1%).

Fig 2: Distribution according to Fetal complications

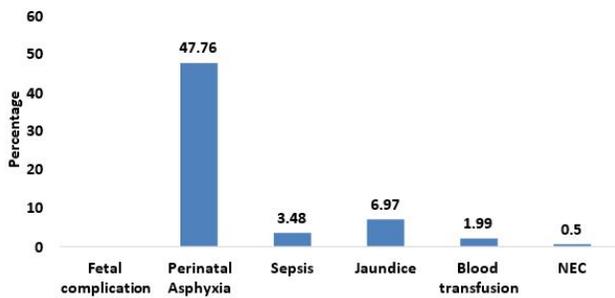


Figure 2 Shows that the maximum fetal complication was Perinatal Asphyxia 96 (47.76%), followed by Sepsis 7 (3.48%), Jaundice 14 (6.97%), and Blood transfusion 4 (1.99%) and NEC 1 (0.50%).

Table 5 shows that the maximum location of uterine rupture was in Lower segment scar dehiscence 94 (46.77%), followed by in lower segment anterior 27 (13.43%), lateral irregular 20 (9.95%), lateral transverse 19 (9.45%), and in lateral longitudinal 14 (6.97%). Injury in the unscarred uterus was maximum in obstructed labour 31 (15.42%), Head obstruction and Fundal pressure 16 (7.96%) each, forceps 8 (3.98%) and perforation 7 (3.48%). The time of rupture was maximum in intrapartum 182 (90.55%) and antenatal 19 (9.45%).

Discussion

In the present study (2020-21), there were 201 cases of uterine rupture out of 34,286 deliveries, with an incidence of 1 in 170. Table 1 is comparable to an Indian study done by Gupta A (0.17%).⁹

In the present study majority of the patients were Hindu 136 (67.66%), followed by Muslim, 62 (30.85%). The majority of the patients, 155 (77.11), belong to the age group of 20-34 years, followed by ≥ 35 years, 36 (17.91%), and ≤ 19 years 10 (4.98%). Maximum patients belong to the multi parity group, 185 (92.04%), and the rest, 16 (7.96%), belong to the primi parity group. The majority of 123 (61.19%) patients have completed 2-3 antenatal checkups, 17 (8.46%) have >4 antenatal checkups, and 14 (6.97%) have not completed any antenatal checkups. The mothers' gestation period was 124 (61.69%) at 37-42 weeks. The place of delivery of 147 (73.13%) mothers was medical college,

43 (21.39%) had a place of delivery at a peripheral hospital and the rest, 11 (5.47%) had home delivery, similar to the study done by Singh A (92.5%).¹⁰

In the present study majority of the patients, 196 (97.51%), have singleton pregnancies, and only 5 (2.49%) have multi-pregnancy. In regard to the previous history of surgery, 111 (55.22%) patients have LSCS, 8 (3.98%) have classical CS, 7 (3.48%) have a myomectomy, and 5 (2.49%) have a perforation. Nagarkatti RS, Ambiyee VR, Vaidya PR. 1991 shows the changing trends in the aetiology of rupture uterus. The incidence of traumatic vaginal delivery as a cause has considerably declined. In contrast, that of previous caesarean scar rupture has doubled.¹¹ Our observation was similar to Sheikh B.N.¹²

The present study reveals that the majority of the patients, 180 (89.55%), have an incomplete rupture, and only 21 (10.45%) have a complete rupture. Regarding treatment done, 64 (31.84%) were treated with total hysterectomy, 60 (29.85%) were treated with subtotal hysterectomy, and 51 (25.37%) were treated with repair with BLTL and 26 (12.94%) treated with the repair without BLTL. 115 (57.21%) of the babies weighed 2.5 kg and above and 86 (42.79%) were underweight. In the case of the maternal outcome, 189 (94.03%) mothers were alive, and 12 (5.97%) died. In perinatal outcome, 160 (80.60%) were alive, and 39 (19.40%) were died. Like the other studies, the most common site of uterine rupture was the lower uterine segment, followed by the left lateral uterine rupture.¹³ Seema Dwivedi et al. had 11.43% maternal deaths.¹⁴ Our finding of perinatal death (19.40%) was much lower than the 86.3%, 92% and 93% of foetal deaths reported in other studies conducted in Nigeria and 98.3%.¹⁵⁻¹⁸

The present study shows that the Hb level of the majority of mothers was 120 (59.70%) was 7-11, and 81 (40.30%) of mothers had preoperative Hb levels of ≥ 12 . On the other hand, the post-operative Hb level of the majority of mothers was 140 (69.65%) 7-11, and 47 (23.38%) of mothers had pre-operative Hb levels of > 7 and 14 (6.97%) mothers had preoperative Hb level of ≥ 11 .

In the present study, it was observed that maternal complications of all mothers 201 (100%) were repeated transfusion followed by Bladder Injury 18 (8.96%), Wound Sepsis 15 (7.46%), Paralytic Ileus 5 (2.49%), Shock with DIC 8 (3.98%), Intestinal Injury 3 (1.49%), DVT 1 (0.50%) and VVF 2 (1%).

In the present study, it was observed that the maximum fetal complication was Perinatal Asphyxia 96 (47.76%), followed by Sepsis 7 (3.48%), Jaundice 14 (6.97%), Blood transfusion 4 (1.99%) and NEC 1 (0.50%).

In the present study maximum location of uterine rupture was in Lower segment scar dehiscence 94 (46.77%), followed by in lower segment anterior 27 (13.43%), lateral irregular 20 (9.95%), lateral transverse 19 (9.45%), and in lateral longitudinal 14 (6.97%). Injury in the unscarred uterus was maximum in obstructed labour 31 (15.42%), Head obstruction and Fundal pressure 16 (7.96%) each, forceps 8 (3.98%) and perforation 7 (3.48%). The time of rupture was maximum in intrapartum 182 (90.55%) and antenatal 19 (9.45%).

Conclusion and Recommendations

The above results concluded that women with uterine rupture had a significantly higher risk of adverse maternal and perinatal outcomes. Most cases of rupture uterus are preventable with good antenatal and intrapartum care and proper identification of high-risk cases. Good antenatal care, counselling about the risk of rupture, convincing the necessity to give follow-up at 37 weeks, and getting women indoors before the onset of labour

and delivery at a well-equipped hospital are necessary. Vigilance during labour, especially in vaginal birth after caesarean and thorough monitoring of the foetal heart, will detect the earliest signs of impending rupture. Immediate and timely intervention can avoid problems. However, further studies are recommended.

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Conflict of interest

None declared.

Ethical approval

The study was approved by the institutional ethics committee.

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