

A Study on Spontaneous Vs Iatrogenic Causes of Uterine Rupture in a Tertiary Care Centre in Eastern India: An Observational Study

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Abstract: ***Background and Aim:** Uterine rupture is defined as a disruption in the continuity of all the uterine layers (endometrium, myometrium, and serosa) any time beyond 28 weeks of pregnancy. The aim of this study was to evaluate the incidence of rupture uterus, as per age, cause, parity, clinical presentations, risk factors, complications, and management. **Methods:** This study was conducted over a period from August 2018 to July 2019, in the Department of Gynaecology and Obstetrics, Darbhanga Medical College and Hospital, DMCH, Darbhanga. All cases of uterine rupture, who were either admitted with or who developed this complication in the hospital, were included in the study. Diagnosis was made on history and examination and was confirmed on laparotomy. Data collected in excel sheet. Continuous variables were expressed as Mean (SD) and ranges. Categorical variables were expressed as numbers and percentage. Non normally distributed variables are expressed as mean (SD) and Mann Whitney U test, Chi square test and fisher exact test were applied whereas applicable. **Results:** The present observation was made on 50 cases of rupture uterus admitted in the department of obstetrics and gynaecology in Darbhanga Medical College and Hospital, DMCH, Darbhanga from August 2018 to July 2019. Result showed that incidence of rupture uterus is more in case of unbooked cases (98%) who has no previous antenatal checkups, more in rural population (92%), ANOVA analysis showed that incidence was higher in parity order 3 or more, parametric tests (student t test) was used to make comparisons in between the cause of rupture uterus with highest incidence seen in spontaneous cases, most frequent site of rupture was in the anterior wall of lower segment, results showed that most cases were managed by hysterectomy, post operative complications were higher in unbooked, spontaneous cases, need for blood transfusion, incidence of overall maternal mortality 4% (paired t test 453.879, $p < 0.001$). **Conclusion:** We concluded that Lack of antenatal care, inappropriate counselling of patients with history of previous caesarean section for hospital delivery, delivery by unskilled birth attendant, misuse of oxytocin and delay in seeking management were the main cause of uterine rupture in this study.*

Keywords: uterine rupture, scarred uterus, unscarred uterus, fetomaternal

1. Background

Rupture uterus is an acute obstetric emergency, associated with high perinatal and maternal morbidity and mortality. Overall incidence is 1/100 to 1/1000, more in developing countries and 50 - 60% occur in the scarred uterus. [1]. Uterine rupture is one of the rare and preventable peripartum obstetric complications where the diagnosis is often missed or delayed leading to maternal and fetal mortality and/or morbidity [2]. In the absence of a history of myomectomy or caesarean section, the uterus is most often described as unscarred. In an unscarred uterus, it is estimated to be between 1/16, 840 and 1/19, 765 deliveries in high - income countries [2], [3]. Spontaneous uterine rupture is defined as a break in the continuity of the uterine wall during pregnancy or labour. This complication occurs mainly in the case of a scarred uterus [1]. The risk factors identified in the literature are numerous but non - specific, the best known being caesarean section and uterine surgery techniques (myomectomy), multiparity, mechanical dystocia and prolonged labour, the use of prostaglandins, misoprostol, oxytocin, obstetric manoeuvres (version, instrumental extractions), external trauma, uterine malformations, Ehler - Danlos syndrome [1], [2], [4], [5], [6]. The clinical presentation of uterine rupture commonly comprises sudden abdominal pain, a sensation of tearing, metrorrhagia and hemodynamic instability evolving towards the circulatory shock [7]. The most common site of rupture uterus in scarred

uterus is over the scar, and in unscarred uterus is lateral wall followed by fundus [7]. Most authors agree that ruptures occurring during labour are more likely to occur in the lower segment, whereas those occurring outside labour are more likely to be corporal [8]. Differentials include abruption, liver rupture, chorioamnionitis [8]. Outcomes of uterine rupture includes maternal outcomes like shock, renal failure, DIC, extension of tear, broad ligament hematoma and fetal outcomes include hypoxia, fetal death. Management is multidisciplinary aiming at stabilising the patient, surgery consent, post for laparotomy as early as possible, blood and blood products arrangement, critical care monitoring. The incidence of maternal mortality rate in rupture uterus cases ranges between 1 to 13% while perinatal mortality is as high as 74 to 94%. Prevention strategies (unscarred uterus) aims at prompt identification of obstructed labour, antenatal identification of malpresentation and managing accordingly, careful use of oxytocic's, carefully performing ECV, IPV, and careful selection of patients for TOLAC (scarred uterus).

2. Method

This study was conducted over a period from August 2018 to July 2019, in the Department of Gynaecology and Obstetrics, Darbhanga Medical College and Hospital, DMCH, Darbhanga. All cases of uterine rupture, who were either admitted with or who developed this complication in the

Volume 13 Issue 3, March 2024

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

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hospital, were included in the study. Diagnosis was made on history and examination and was confirmed on laparotomy. Data collected in excel sheet. Continuous variables were expressed as Mean (SD) and ranges. Categorical variables were expressed as numbers and percentage. Non normally distributed variables are expressed as mean (SD) and Mann Whitney U test, Chi square test and fisher exact test were applied whereas applicable. Primary objective was to study the cause and management of uterine rupture in unscarred vs scarred uterus and secondary objective was to study fetomaternal outcome in terms of maternal morbidity and mortality and perinatal morbidity and mortality. The surgical procedure depended on general condition of the patients, parity, and desire for future childbearing, site, severity, and extent of rupture. The surgical management comprised one of the three methods: repair of uterus without tubal ligation, repair with tubal ligation or hysterectomy. All patients were followed up until their discharge from the hospital.

3. Results

Table 1 & Fig 1 comparison of incidence of uterine rupture in booked and unbooked cases:

Table 1

	Booked	Unbooked
Cases of Uterine Rupture	1	49
Percentage	2%	98%

It is evident from table 1 and figure 1 that incidence of rupture uterus is more in case of unbooked cases (98%) who has no previous antenatal checkups and is negligible among those who has minimal antenatal visit.

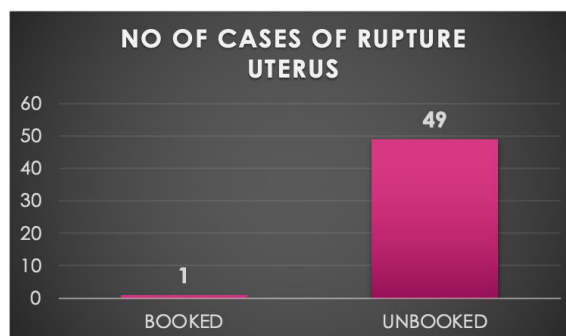


Figure 1

Table 2: Distribution of the cases of uterine rupture in the rural and urban population:

	Rural	Urban	Total
Number of Cases	46	4	50
Percentage	92	8	100%

Tab 2 shows that that incidence of rupture uterus was more in the rural population (92%) than urban (8%).

Table 3: Distribution of the cases according to parity

	Para 1	Para 2	Para 3	Para 4	F (ANOVA)	p value
Mean (SD)	27.07 (2.78)	29.05 (3.07)	31.00 (NA)	34 (NA)	5.178	0.001
Median (IQR)	17 (16 - 22)	22 (21 - 32)	8 (31 - 31)	3 (34 - 34)		
Range	25 - 35	25 - 35	31 - 31	34 - 34		

The variable Age (Years) was normally distributed in the 4 subgroups of the variable Obstetric History.

Thus, parametric tests (One-Way ANOVA) were used to make group comparisons.

There was a significant difference between the 4 groups in terms of Age (Years) (F = 5.178, p = <0.001), with the mean Age (Years) being highest in the Obstetric History: Para 2 group.

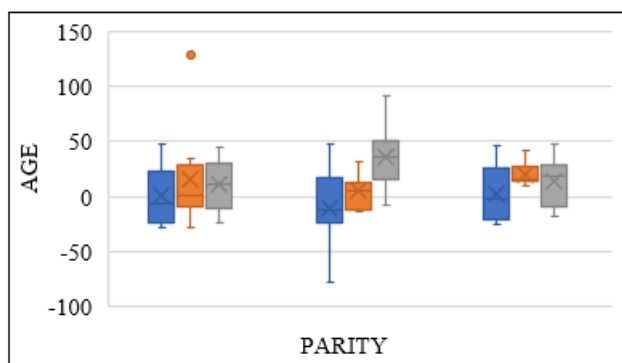


Figure 3

Table 4 (a): Distribution of the cases according to causes of Uterine Rupture

Obstructed labour	13	46%
Grand multiparity	5	18%
Use of uterotonics	6	21%
Uterine anomalies	1	3%
Placenta accreta spectrum	3	11%
TOTAL	28	100%

It is evident from table 4. “(a)” & figure 4 that in majority of the cases spontaneous rupture (56%) followed by previous scarred uterus (42%) is the commonest cause of rupture uterus.

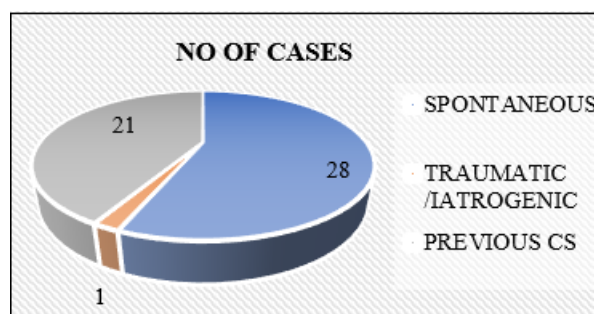


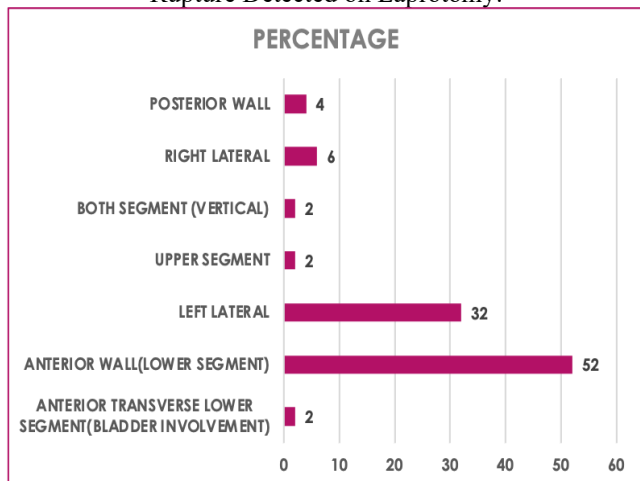
Figure 4

Table 4 “(b)”

Causes	No. of Cases	Percentages
Spontaneous	28	56
Traumatic /Iatrogenic	1	2
Previous CS	21	42

In Tab 4. “(b)” shows that the leading cause of uterine rupture in unscarred uterus group is obstructed labour (46%), followed by injudicious use of uterotonics (21%).

Table 5: Distribution of the Cases according to the site of Rupture Detected on Laprotomy:



It is apparent from Table 5 that the most frequent site of rupture was in the anterior wall of lower segment (52%). Left lateral tear is more common than right lateral tear (6%).

Table 6: Surgical Management in type of Uterine Rupture:

Types of Surgery	Number	Percentage
Hysterectomy	26	52%
Repair of Tear	8	16%
Repair of Tear and Ligation	16	32%

It is apparent from Table 6 that in majority of cases hysterectomy was done followed by repair of tear with ligation. There was bladder involvement too which was repaired along with hysterectomy.

Table 7: Post Operative Maternal and Neonatal Complications

	No.	Percentage
Uneventful	25	50%
Intraperitoneal Bleed	6	12%
Shock	6	12%
Sepsis	4	8%
Bladder Rupture	4	8%
Fetal Death	5	10%
Total	50	100%

Tab 7 shows that postoperative complications encountered were maximum intraperitoneal bleed 12%, shock 12% whereas 50% of the cases remained uneventful in postoperative period.

4. Discussion

Rupture uterus is an important obstetric emergency. With ready access to obstetric care including caesarean section for obstructed labor, rupture of the unscarred uterus should be rare [9]. If a gravid woman presents with hypotension, abdominal pain, fetal distress and vaginal bleeding, rupture uterus should be considered. Most of the women in this study were between the age group 21 - 35 years. Majority of patients were unbooked. Majority of the rupture occurred in Para.2 - 3. Most of the rupture occurred in labour. The lower segment uterine rupture was the most common site of rupture in this study. Mismanaged labour, injudicious use of oxytocic's, obstructed labour, instrumental delivery, and placenta percreta were found to be the most common risk factors. The increased risk of uterine rupture attributable to the use of oxytocin in multigravida with unscarred uteri is uncertain. Maternal mortality was 4%. Sub - total hysterectomy was performed in majority of the cases, later that repair of the rupture uterine site with tubal ligation was performed.

The findings of the study were consistent were standard literatures that states that the therapeutic management of the uterine rupture remains a medical and surgical emergency. It includes medical resuscitation followed by surgical exploration via the laparotomic route. Although most authors recommend a hysterectomy, conservative treatment by hysterorrhaphy can nevertheless be carried out in cases where reconstruction is technically possible, particularly in young patients who wish to have subsequent pregnancies [11, 12].

For women with a suspected uterine rupture, the initial assessment is for hemodynamic stability. Blood pressure and heart rate should be obtained to assess for hypotension and tachycardia. Common symptoms of hypotension include lightheadedness, dizziness, nausea, vomiting, and anxiety. Most of the bleeding associated with a uterine rupture is intraabdominal and cannot be detected by the patient. When vaginal bleeding occurs, it is helpful to differentiate between light spotting and significant blood - soaked linen.

With quick surgical intervention and resuscitation, most women survive a uterine rupture. The maternal mortality rate associated with the rupture of an unscarred uterus is higher (10%) than the mortality rate associated with the rupture of a scarred uterus (0.1%). [13][14] The neonatal mortality rate after uterine rupture is 6% to 25%. [15]

The risk of recurrent rupture after the uterine repair is not well described. [16] This is because the incidence of rupture is low, and many women with a significant uterine rupture require a hysterectomy. In a few small case series conducted outside the United States, the incidence of repeat rupture was 33% to 100%. [17] There is low - level evidence that the repeat rupture rate may be higher when the initial rupture occurs in the uterine fundus. [16] Due to the maternal and fetal risk of repeat rupture, most obstetricians recommend repeat cesarean delivery between 36 and 37 weeks—before labor is allowed to begin. [16]

5. Conclusions

Education and proper care especially of high - risk patients like previous caesarean by competent personal, proper use of oxytocin and early referral may help to reduce the incidence of “rupture uterus”. Lack of antenatal care, inappropriate counselling of patients with history of previous caesarean section for hospital delivery, delivery by untrained birth attendants, misuse of oxytocin and delay in seeking management are the main cause of ruptured uterus in this study. Proper antenatal care and updated training courses of health care providers should be stressed to prevent this catastrophic but avoidable complication.

vaginal birth after cesarean delivery: A review of the literature. *Am J Obstet Gynecol.*2003 Aug; 189 (2): 408 - 17. [PubMed: 14520209]

- [14] Kwee A, Bots ML, Visser GH, Bruinse HW. Uterine rupture and its complications in the Netherlands: a prospective study. *EurObstet*
- [15] Larrea NA, Metz TD. Pregnancy After Uterine Rupture. *Obstet Gynecol.*2018 Jan; 131 (1): 135 - 137. [PubMed: 29215521]
- [16] Usta IM, Hamdi MA, Musa AA, Nassar AH. Pregnancy outcome in patients with previous uterine rupture. *Acta Obstet Gynecol Scand.*2007; 86 (2): 172 - 6. [PubMed: 17364280]

References

- [1] Parant O. Rupture utérine: prédiction, diagnostic et prise en charge. *J Gynécologie Obstétrique Biol Reprod.* déc 2012; 41: 803–16
- [2] Gibbins KJ, Weber T, Holmgren CM, Porter TF, Varner MW, Manuck TA. Maternal and fetal morbidity associated with uterine rupture of the unscarred uterus. *Am J Obstet Gynecol* 2015; 213 (3) 382. e1 - 382. e6.
- [3] Landon MB. Uterine rupture in primigravid women. *Obstet Gynecol* 2006; 180: 709–10.
- [4] Amate P, Se ´ror J, Aflak N, Luton D. Rupture uterine pendant la grossesse. *EMC Obstet* 2014; 10 [5 - 080 - A - 10].
- [5] Smith JG, Mertz HL, Merrill DC. Identifying risk factors for uterine rupture. *Clin Perinatol* 2008; 35 (1): 85–99.
- [6] Hagneré P, Denoual I, Souissi A, Deswarte S. Rupture utérine spontanée après myomectomie. A propos d’un cas et revue de la littérature. *J Gynecol Obstet Biol Reprod* 2011; 40 (2): 162–5
- [7] Khediria Zied, Mbarkia Chaouki, Anis Ben Abdelaziza, Hsayaouia Najeh, Slim Khelif A, Chaabene Mariem, Mezghennib Sana. Oueslatia Hedhili. Rupture utérine spontanée de découverte tardive sur utérus sain après utilisation du mi
- [8] Bretones S, Cousin C, Gualandi M, Mellier G. Rupture uterine. *J Gynecol Obstet Biol Reprod* 1997; 26: 324–7.
- [9] Hruska Karim M, Coughlin Bret F, Coggins Allahna A, Wiczuk Halina P. MRI diagnosis of spontaneous uterine rupture of an unscarred uterus. *Emerg Radiol* 2006; 12: 186–8.
- [10] Sakr R, Berkane N, Barranger E, Dubernard G, Daraï E, Uzan S. Unscarred uterine rupture: case report and literature review. *Clin Exp Obstet Gynecol* 2007; 34: 190–2.
- [11] Walsh CA, Baxi LV. Rupture of the primigravid uterus: a review of the literature. *Obstet Gynecol Surv* 2007; 62: 327–34.
- [12] Kapoor DS, Sharma SD, Alfirevic Z. Management of unscarred ruptured uterus. *J Perinat Med.*2003; 31 (4): 337 - 9. [PubMed: 12951891] *Gynecol Reprod Biol.*2006 Sep - Oct; 128 (1 - 2): 257 - 61. [PubMed: 16530918]
- [13] Chauhan SP, Martin JN, Henrichs CE, Morrison JC, Magann EF. Maternal and perinatal complications with uterine rupture in 142, 075 patients who attempted