Original Research Article

Retrospective study of uterine rupture at tertiary care centre

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Abstract

Background: Rupture uterus is a catastrophic obstetric event and a preventable complication of pregnancy and labour; delay in diagnosis and treatment of which can bring about adverse maternal and perinatal outcome. Incidence of uterine rupture varies from 0.3/1000 to 7/1000 deliveries in India accounting for 5% to 10% of all maternal deaths and a perinatal mortality of 75% to 93%. The most important risk factor for uterine rupture is the presence of a scarred uterus. Early diagnosis and treatment of uterine rupture results in better chances of maternal and fetal outcome. The aim of present study was to analyse the incidence, causes, other risk factors, complications, management, maternal and fetal outcome associated with uterine rupture at a tertiary health care centre. **Material and Methods:** Present study was a retrospective, descriptive study, of pregnant women, admitted or diagnosed as uterine rupture and findings confirmed on laparotomy. Different mode of management were studied. Post-operative maternal morbidity, mortality and neonatal morbidity, mortality was studied and perinatal outcome was measured. **Results:** During study period total 36 cases of uterine rupture were managed at our center. The incidence of uterine rupture was 1:786 deliveries. Most common age was 26-30 years while parity 1-3 was most common among uterine rupture patients. 8% were parity 4 or more. Out of 36 cases, 29 occurred in patients with prior caesarean sections and 7 were without prior caesarean section. In present study abdominal pain (94%), fetal bradycardia/ tachycardia (81%), intrapartum vaginal bleeding (58%), cessation of uterine contractions (31%) were most common presenting symptoms. Previous LSCS (81%) was most common cayse of uterine rupture in present study. Other causes were obstructed labour (3%), oxytocics (3%), malpresentations (3%), congenital uterine anomaly (3%), spontaneous rupture (3%), instrumental delivery (3%), grandmultipara (3%). Lower segment was most common site of rupture (78%), followed by both segment involvement (19%). Uterine conservation was done in 72% patients while 28% required hysterectomy. Other intra-operative complication observed were broad ligament haematoma (8%), bladder injury required repair (6%), >2 PCV blood transfusion (58%). Other surgical procedures like Internal Iliac artery ligation was performed in 5 women in our study. Maternal anemia (75%) was most common maternal morbidity, followed by ventilator support (22%) and postoperative shock (17%). 8% maternal mortality was noted in present study. Unscarred uterine rupture has more mortality than scarred uterine rupture. Poor perinatal outcome was noted as 69% still birth and 75% total perinatal mortality. **Conclusion:** Vaginal birth after previous uterine scar is the greatest risk for uterine rupture and is worsened by augmentation of labour. To conduct TOLAC (trial of labour after caesarean) caution in the use of oxytocic for induction or augmentation and available facilities for emergency surgical intervention are must.

Keywords: Previous LSCS, Rupture Uterus, Hysterectomy, TOLAC.

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INTRODUCTION

Uterine rupture is defined as a full-thickness separation of the uterine wall and overlying visceral peritoneum.[1] Uterine rupture may be primary occurring in a previously intact or unscarred uterus or secondary with an associated pre-existing myometrial incision, injury or anomaly.[2] Incidence of uterine rupture varies from 0.3/1000 to 7/1000 deliveries in India accounting for 5% to 10% of all maternal deaths and a perinatal mortality of 75% to 93%.[3,4] The most common cause of emergency peripartum hysterectomy are uterine rupture and uterine atony. The most important risk factor for uterine rupture is the

presence of a scarred uterus, usually secondary to uterine surgery such as a myomectomy or caesarean section. Very few patients may present with the classical onset of severe abdominal pain, cessation of uterine contractions, absence of foetal heart rate, vaginal bleeding, palpable foetal parts on abdominal exam and maternal shock and therefore uterine rupture should be looked for with a high index of suspicion. Rupture uterus is a catastrophic obstetric event and a preventable complication of pregnancy and labour; delay in diagnosis and treatment of which can bring about adverse maternal and perinatal outcome. Uterine rupture contributes significantly to both fetal and maternal mortality, serous morbidities and loss of fertility from hysterectomy. The severity of fetal and maternal morbidity depends on the extent of uterine rupture.[5] Early diagnosis and treatment of uterine rupture results in better chances of maternal and fetal outcome. The aim of present study was to analyse the incidence, causes, other risk factors, complications, management, maternal and fetal outcome associated with uterine rupture at a tertiary health care centre.

MATERIAL AND METHODS

Present study was a retrospective, descriptive study, of pregnant women, admitted or diagnosed as uterine rupture in department of obstetrics and gynaecology, Vardhman institute of medial science Pawapuri , over the period of 3 years (from August 2017- June 2020). Approval from institutional ethical committee was taken. Patients admitted with or developed uterine rupture in the hospital and findings confirmed on laparotomy, during study period were included in the present study. Relevant complaints, obstetric history, past history was documented. Clinical course, investigations, associated risk factors were evaluated. Intraoperative findings such as site, extent of rupture, associated complications and adjacent organ injury were noted. Different mode of management were studied. Post-operative maternal morbidity, mortality and neonatal morbidity, mortality was studied and perinatal outcome was measured. All the data was entered in Microsoft excel and analysed. Statistical analysis was done using descriptive statistics. The data collected was analysed statistically. Statistical analysis was performed using SPSS 24. Quantitative variables were expressed as Mean ± SD (standard deviation) while qualitative variables were expressed as relative frequency and percentage.

RESULTS

During study period total 36 cases of uterine rupture were managed at our center. The incidence of uterine rupture was 1:786 deliveries. Most common age was 26-30 years while parity 1-3 was most common among uterine rupture patients. 8% were parity 4 or more. Out of 36 cases, 29 occurred in patients with prior caesarean sections and 7 were without prior caesarean section.

Table 1: general characteristics

Parameter	No. of patients	Percentage (%)
Maternal age		
< 25	6	17%
26-30	14	39%
31-35	9	25%
>35	7	19%
Parity		
0	4	11%
1-3	29	81%
≥4	3	8%
Gestational age		
Less than 28 weeks	2	6%
28-32 weeks	5	14%
33-36 weeks	9	25%
37-40 weeks	20	56%

In present study abdominal pain (94%), fetal bradycardia/ tachycardia (81%), intrapartum vaginal bleeding (58%), cessation of uterine contractions (31%) were most common presenting symptoms.

Table 2: Presenting symptom

Presenting symptom	No. of patients	Percentage (%)
Abdominal pain	34	94%
Fetal bradycardia/ tachycardia	29	81%
Intrapartum vaginal bleeding	21	58%
Cessation of uterine contractions	11	31%
Haematuria	6	17%
Peripartum collapse	3	8%

Previous LSCS (81%) was most common cause of uterine rupture in present study. Other causes were obstructed labour (3%), oxytocics (3%), malpresentations (3%), congenital uterine anomaly (3%), spontaneous rupture (3%), instrumental delivery (3%), grandmultipara (3%).

Table 3: Causes of uterine rupture

ETIOLOGY	No. of patients	Percentage (%)
Previous LSCS	29	81%
Obstructed Labour	1	3%
Oxytocics	1	3%
Malpresentations	1	3%
Congenital uterine anomaly	1	3%
Spontaneous rupture	1	3%
Instrumental delivery	1	3%
Grandmultipara	1	3%

Lower segment was most common site of rupture (78%), followed by both segment involvement (19%). Uterine conservation was done in 72% patients while 28% required hysterectomy. Other intra-operative complication observed were broad ligament haematoma (8%), bladder injury required repair (6%), >2 PCV blood transfusion (58%). Other surgical procedures like Internal Iliac artery ligation was performed in 5 women in our study.

Table 4: Intra-operative findings

Intra-operative findings	No. of patients	Percentage (%)
Site of rupture		
Upper segment	1	3%
Lower segment	28	78%
Both	7	19%
Mode of management		
Rent repair	26	72%
Obstetric hysterectomy - Subtotal	3	8%
Obstetric hysterectomy - Total	7	19%
Intraop complication		
Broad ligament haematoma	3	8%
Bladder injury	2	6%
Blood transfusion (>2)	21	58%

Maternal anemia (75%) was most common maternal morbidity, followed by ventilator support (22%) and postoperative shock (17%). 8% maternal mortality was noted in present study. Unscarred uterine rupture has more mortality than scarred uterine rupture. Poor perinatal outcome was noted as 69% still birth and 75% total perinatal mortality.

Table 5: Maternal and perinatal outcome.

Outcome	Number	%
Maternal morbidity		
Anemia	27	75%
Ventilator support	8	22%
Postoperative shock	6	17%
Puerperal sepsis	1	3%
Burst abdomen	1	3%
Maternal mortality		
Total	3	8%
Scarred uterus.	1	3%
Unscarred uterus	2	6%
Perinatal outcome		
Still birth	25	69%
Live birth	11	31%
Apgar <5 at 1 minute	8	22%
Early neonatal death	2	6%
Total perinatal mortality	27	75%

DISCUSSION

Uterine rupture during pregnancy is a rare occurrence whereas uterine scar dehiscence is more common and seldom results in major maternal or foetal complication. Several factors are known to increase the risk of uterine rupture but previous cesarean section is the main risk factor for uterine rupture. Rupture of an unscarred uterus may be either traumatic or spontaneous. Traumatic factors include abdominal trauma, labor induction and in particular the usage of oxytocin or prostaglandins. Internal podalic version, assisted breech delivery and instrumental delivery also have been linked to traumatic rupture. Previous caesarean section had been one of the leading cause of uterine rupture in developed countries, while uterine rupture from unscarred uterus is more prevalent in less and least developed countries.[7] In developing countries major causes of uterine rupture are obstetric complications, teen-age mothers with cephalo-pelvic disproportion, unsupervised labour and poor socio-economic status. Other risk factors for uterine rupture include grand multi-parity, use of uterotonic drugs to induce or augment labour, obstructed labour, malpresentation, placenta percreta and rarely intrauterine manipulations such as internal podalic version and breech extraction.[8] In present study, most common age group was 26-30 year age group (39%). This was similar to the study by Sunanda *et al.*[9] who found median age being 25 years and Rashmi *et al.*,[4] who found 22-30 years age group being commonest median age being 25 years. In present study 8% were parity 4 or more. Higher parity is another risk factor for uterine rupture particularly in spontaneous rupture and induction cases. In study by Singh M.,[10] 7% of the total cases were grand multipara and 91.2% were para 1 to 4. While Rathod S[11] reported rupture 2.7% cases in grand multipara and 95.8% in para 1-4. Patients with previous uterine surgery are more prone for uterine rupture in subsequent delivery depending upon the indication of previous LSCS, interconceptional period, number of caeserian deliveries. In study by Desai A *et al.*.,[12] previous caeserian delivery was the most common cause (57%) among uterine rupture followed by obstructed labour (14%), instrumental delivery (7%), inadvertent use of oxytocics (14%), grand multipara (7%). Similar findings were noted in present study. Most common cause of uterine rupture in present study was previous caeserian delivery seen in 81% cases which is comparable to other similar Indian studies like Sahu *et al.*[13] and Rashmi *et al.*[4]. Common causes among unscarred uterus was being multigravida with obstructed labour (14%) and inadvertant use of oxytocics (14%) leading to uterine hyperstimulation in study by Desai A *et al.*[12] Attempt at vaginal birth following previous caesarean delivery has been associated with an increased risk of uterine rupture compared to repeat elective caesarean delivery.[14,15] It has been recommended to conduct vaginal birth after previous uterine scar in appropriately equipped facilities for adequate monitoring, strict criteria for selection, cautious use of oxytocin if required and prompt intervention. Regarding management of rupture uterus options are either repair or hysterectomy (total or subtotal). Uterine repair should be reserved for women who have low transverse rupture, no extension of the tear to broad ligaments, cervix or vagina, easily controllable hemorrhage, good general condition, desire for future child bearing and no evidence of gross infection. In present study 72% patients underwent repair. Various Indian studies had rent repir rate from 58.33to 75%.[13,16,17] Turgut A *et al.*, [18] in a study from Turkey had 34.4% cases with scar repair and total abdominal hysterectomy each,

subtotal hysterectomy in his study was done in 31.1%. In other Indian studies also the hysterectomy rate varied; 41.5% by Sahu L[13], 32% by Sunitha K *et al.*,[19], 29.82% by Gupta A[16] and 17% from Singh M study.[10] A very high perinatal mortality is the hallmark of rupture uterus, the incidence ranging from 75% to 93%. Simialr findings were noted in present study. Myomectomy is also a common cause for rupture in future pregnancies. Bernardi *et al.*[22]. in reviewed 55 pregnancies that followed laparoscopic myomectomy and found a uterine rupture rate of 10% within a follow-up period of 73.55months. Uterine rupture in these cases was found to occur in patients with a short (<12months) LM to conception interval, cases where the endometrial cavity had been entered at myomectomy and those in which large (diameter > 4 cm) fibroids had been removed. Expert recommends that intraoperative strategies to reduce uterine rupture in subsequent pregnancies include multilayer uterine closure, avoidance of entry into the endometrial cavity, avoidance of excessive electrosurgery to reduce devascularization, and prevention of haematoma formation, which may affect wound strength.[23,24] Ultrasonography is a useful tool in antenatal diagnosis of spontaneous uterine rupture with sonographic findings of extra-peritoneal hematoma, intrauterine blood, free peritoneal blood, an empty uterus and a large uterine mass with gas bubbles suggestive of rupture.[25] Limitations of present study were retrospective design, restriction to a single centre and confined to the local constraints that may be peculiar to the study area and the study site. Recent large studies are required, as presently focus is shiftoing towards prevention of rupture in scarred uterus. Anticipating uterine rupture in patients having risk risk factors, timely diagnosis and minimizing the time from diagnosis to definitive treatment are the most critical aspects in minimizing the maternal mortality from this obstetric catastrophe.

CONCLUSION

Vaginal birth after previous uterine scar is the greatest risk for uterine rupture and is worsened by augmentation of labour. To conduct TOLAC (trial of labour after caesarean) caution in the use of oxytocic for induction or augmentation and available facilities for emergency surgical intervention are must. Proper antenatal care and appropriate counselling of patient with previous cesarean section for hospital delivery is must to prevent uterine rupture and its attendant complications.

REFERENCES

1. P. Veena, S. Habeebullah, and L. Chaturvedula, "A review of 93 cases of ruptureduterus over a periodof 2 years ina tertiary care hospital in South India," Journal of Obstetrics and Gynaecology, vol. 32, no. 3, pp. 260–263, 2012.
2. Cunningham F (2014) Obstetrical Haemorrhage and Prior Caesarean Delivery. Williams Obstetrics. (24th edn), Mc-Graw-Hill Education, 609-620.
3. Ranu J, Mamta KS (2018) Ruptured uterus outcome among the pregnant women admitted in a tertiary care centre. Int J Reprod Contracept Obstet Gynecol 7: 1718-1722.
4. Rashmi D, Amitha VK (2017) Ruptured uterus: A prospective observational study of 25 consecutive cases in a tertiary referral centre in South India. Int J Reprod Contracept Obstet Gynecol 6: 2601-2606.
5. 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;17:117.
6. Nohira T,Onodera T,Isaka K. Emergency postpartum hysterectomy: incidence, trends, indications, and complications. Hypertension Research in Pregnancy 2014; 2: 88–93
7. Vladimir Revicky AM, Mukhopadhyay S, Mahmood T. A case series of uterine rupture: lessons to be learned for future clinical practice. J Obstet Gynaecol India. 2012;62(6):665–73.
8. Ansong G, Sebuabe SA, Afrani AK (2020) Uterine Rupture Following Misoprostol Induction of Labour at 36 Weeks Gestation in an Unscarred Uterus. Obstet Gynecol Cases Rev 7:158.
9. Sunanda N *et al.*. A two-year analysis of uterine rupture in pregnancy Int J Reprod Contracept Obstet Gynecol. 2016 Nov;5(11):3983-86.
10. Singh M, Kanti V, Seth S, Gupta V, Kumari K, Mishra P. Maternal and perinatal outcomes of rupture uterus at rural tertiary care institution: a retrospective study. Int J Reprod Contracept Obstet Gynecol 2016;5:2233-8.
11. Rathod S, Kumar S, Swain S. A three year clinicopathological study of cases of rupture uterus. Journal of Clinical and Diagnostic Research. 2015;9(11):QCO4-6.
12. Archish Desai, Dipali Sivasane, Dinal Gandhi *et al.*. A retrospective study of uterine rupture in tertiary care hospital over three years. Indian J Obstet Gynecol. 2019;7(2):125-128.
13. Sahu L. A 10 year analysis of uterine rupture at a teaching institution. J Obstet Gynaecol India. 2006; 56(6):502-06.
14. Al-Zirqi I, Stray-Pedersen B, Forsén L, Vangen S. Uterine rupture after previous caesarean section. BJOG 2010;117:809-20.
15. Manoharan M, Wuntakal R, Erskine K. Uterine rupture: A revisit. Obstet Gynaecol 2010;12:223-30.
16. Gupta A, Nanda S. Uterine rupture in pregnancy: a five year study. Arch Gynecol Obstet. 2011;28(3):437-41.
17. Abha S, Srivastava C. Uterine rupture still a harsh reality. Journal of Obstetrics and gynaecology India. 2015:65(3):158-61.
18. Turgut A, Evsen MS. Uterine rupture revisited: predisposing factors, clinical, management and outcomes from tertiary care centre in Turkey. Pak J Med Sci. 2013;29(3);753-7.
19. Sunitha K, Indira I, Suguna P. Clinical study of rupture uterus- Assessment of Maternal and fetal outcome. IOSR Journal of Dental and Medical sciences/ 2015;14:39-45

20. Ehigiegba AE, Adeyemo IS. Uterine rupture in labour: a continuing obstetric challenge in developing countries- the Benin experience. J Med Biomed Research. 2006;5:44-50.
21. Bujold E, Gauthier RJ. Neonatal morbidity associated with uterine rupture: what are the risk factors? Am J Obstet Gynecol. 2002;186:311-4.
22. T. S. Bernardi, M. P. Radosa, A. Weisheit *et al.*, "Laparoscopic myomectomy: a 6-year follow-up single-center cohort analysis of fertility and obstetric outcome measures," Archives of Gynecology and Obstetrics, vol. 290, no. 1, pp. 87–91, 2014.
23. V. A. Buckley, E. M. Nesbitt-Hawes, P. Atkinson *et al.*, "Laparoscopic myomectomy: clinical outcomes and comparative evidence," Journal of Minimally Invasive Gynecology, vol. 22, no. 1, pp. 11–25, 2015.
24. R. Flyckt and T. Falcone, "Uterine rupture after laparoscopic myomectomy," The Journal of Minimally Invasive Gynecology, vol. 22, no. 6, pp. 921–922, 2015.
25. Banu D, Cem D (2009) Maternal death after uterine rupture in an unscarred uterus: A case report. The Journal of Emergency Medicine 37: 393-395.

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