Original Research Article

An observational study of uterine rupture at a tertiary care center

Sangeeta Tvinwal[1]*, Pooja Meena[1], Bharat Bhushan Bamaniya[2]

[1]Department of Obstetrics and Gynecology, Ravindra Nath Tagore Medical College, Udaipur, Rajasthan, India
[2]Department of General Surgery, Post Graduate Institute of Medical Education and Research, Chandigarh, India

*Correspondence:
Dr. Sangeeta Tvinwal,
E-mail: sbapna.1@gmail.com

ABSTRACT

Background: Uterine rupture is one of the most dangerous obstetric emergency situations carrying an increased risk of maternal and perinatal morbidity and mortality. This catastrophic complication occurs most often in women attempting a vaginal birth after a prior LSCS. Aim was to determine the incidence, etiology, management, maternal and fetal outcome. Recommend strategy for its prevention to reduce the incidence of maternal and fetal morbidity and mortality.
Methods: This prospective observational study was conducted over a period of 1 year. Total 51 cases who were diagnosed with rupture were included in the study. Emergency laparotomy after pre-operative resuscitation done. Hysterectomy or repair of rupture site was done depending on the condition of the patient, parity, presence or absence of infection.
Results: Maximum patients of uterine rupture belonged to 37-40 weeks of GA. Inter-delivery interval <18-24 week were more vulnerable. Patients with previous caesarean section was more than without section. Maximum cases presented with signs of shock. Maternal death rate was 11.63%, whereas perinatal death rate was 82.35%.
Conclusions: Uterine rupture is a major contributor to maternal morbidity and neonatal mortality. Four major easily identifiable risk factors are: history of prior caesarean section, grand multiparity, obstructed labor, and fetal malpresentations. Identification of these high-risk women, prompt diagnosis, immediate transfer, and optimal management needs to be overemphasized to avoid adverse feto-maternal complications.

Keywords: Fetal outcome, Maternal mortality, Scarred uterus, Uterine rupture

INTRODUCTION

Uterine rupture is one of the most dangerous obstetric emergency situations carrying an increased risk of maternal and perinatal morbidity and mortality. This catastrophic complication occurs most often in women attempting a vaginal birth after a prior LSCS.

There is a wide variation in incidence between developed and developing countries. In developing countries, the incidence is high due to socio-economic factors, cultural practices, lack of access to antenatal and intranatal care, prolonged and obstructed labor. In recent decades incidence of caesarean section has increased due to liberalization of indication of caesarean section even in developing countries. This contributes more to rupture uterus in developing countries which is also more prevalent in developed countries. Rupture of unscarred uterus may be traumatic or spontaneous. Traumatic factors include abdominal trauma, early and injudicious use of oxytocin or prostaglandins, internal podalic version, assisted breech delivery, and instrumental delivery.[1]

Spontaneous rupture is usually observed in cephalo pelvic disproportion malpresentation and delivery of grossly anomalous foetus. The prevalence was found to be significantly higher in underdeveloped countries of Asia and Africa in comparison to high income countries. In developed countries the prevalence of uterine rupture with previous cesarean section is around 1% and without previous cesarean section it is around 0.1%. For less and least developed countries uterine rupture is more prevalent

and a serious problem. In developing countries maternal mortality ranges between 1% and 13% and perinatal mortality between 74% and 92%. Previous cesarean section is the main risk factor for uterine rupture.[2]

The sign and symptoms of uterine rupture depends upon site and extent of uterine defect. Patient presents with sudden severe abdominal pain, features of hypovolemic shock, maternal tachycardia, hematuria, tender distended abdomen, abnormal uterine contour, cessation of uterine contraction, easily palpable fetal parts, and absent fetal heart sound.

Maternal consequences of uterine rupture depend upon the time between diagnosis and surgical management. Fetal consequences are admission to NICU due to fetal hypoxia or anoxia and neonatal death or intrauterine fetal death. Once diagnosed management must include supportive therapy for mother until surgical intervention can arrest life threatening hemorrhage.[3,4]

Management of uterine rupture depends on prompt detection and diagnosis. The classic signs (sudden tearing uterine pain, vaginal haemorrhage, cessation of uterine contractions, regression of the fetus) have been shown to be unreliable and frequently absent but any of the these should alert suspicion: cardiotocograph (CTG) abnormalities, especially fetal bradycardia; severe abdominal pain changing so that it persists between contractions; chest or shoulder tip pain and sudden shortness of breath; scar pain and tenderness; abnormal vaginal bleeding or gross haematuria; cessation of previously efficient uterine contractions; maternal tachycardia, hypotension or shock; movement away of the presenting part. Abdominal palpation may reveal obvious fetal parts as the fetus passes either partially or totally out of the uterus and into the abdominal cavity, with a high risk of intrapartum death.

If there is suspicion of uterine rupture, laparotomy may still be required even after a successful vaginal delivery, to assess damage and to control bleeding.[5]

Investigations like ultrasound can be used to diagnose rupture prior to labour when it may show an abnormal fetal position, hemoperitoneum or absent or thin uterine wall. Ultrasound is being analysed as a tool to predict uterine rupture. A French study suggests that a uterine wall thickness of greater than 4.5 mm has negative predictive value of 100% but unfortunately the positive predictive value of thickness less than 3.5 mm is poor at only 11.8%.[15] Intrauterine pressure catheters are sometimes used but may fail to show loss of uterine tone or contractile patterns following uterine rupture.

Management

The initial management is the same as for other causes of acute fetal distress- urgent surgical delivery.[4,5] Resuscitation as necessary.

Uterine repair if possible; hysterectomy may be indicated if haemorrhage persists- either total or sub-total, depending on the site of rupture and the patient's condition.

There is no firm evidence regarding which type of thread, knotting or sequence of suturing is more favourable to reduce the risk of uterine rupture after VBAC or hysterotomy after myomectomy.

In cases of lateral rupture involving lower uterine segment and uterine artery where haemorrhage and haematoma obscure the operative field, ligation of the ipsilateral hypogastric artery to stop bleeding may be needed.

If a uterine repair has been achieved it is important to note that repeat rupture occurs in approximately 20% of cases.

In all cases of operative delivery, especially where there are risk factors for uterine rupture, a thorough examination of the uterus and birth canal is required.

Aim

To determine the incidence, etiology, management, maternal and fetal outcome. Recommend strategy for its prevention to reduce the incidence of maternal and fetal morbidity and mortality.

METHODS

A prospective observational study was conducted over a period of 1 years from January 2019 to December 2019 at RNT Medical College, Udaipur. Total of 51 cases who were diagnosed with rupture were included in the study. During this period 15673 deliveries occurred. Detailed history regarding maternal age, parity, gestational age of fetus, booked or unbooked status, residential address, etiological factors like previous caesarean section, inter delivery interval was taken in account.

Information regarding induction or augmentation of labour, instrumentation or intra uterine manipulation intervention done at primary health centre was taken from the accompanying medical attendant or with the help of referral slip.

Emergency investigation as hemoglobin, blood grouping and cross matching, viral markers, bleeding time and clotting time were done. Emergency laparotomy after pre-operative resuscitation done. Hysterectomy or repair of rupture site was done depending on the condition of the patient, parity, presence or absence of infection. Depending on the blood loss blood transfusions were given during intraoperative for postoperative period.

Statistical analysis

Data was collected and entered in MS Excel software version 2019 and analysed using statistical for social sciences (SPSS 20). Descriptive format and diagrammatic

presentation was done using bar diagram or pie chart as required. For descriptive analysis we used mean, standard deviation, ratio and proportion with percentage. The quantitative data, if required was analysed using independent Student's t test, p<0.05 was considered as level of statistical significance.

RESULTS

Maximum patient of uterine rupture belonged to 37-40 weeks. Inter-delivery interval <18-24 week were more vulnerable. Patients with previous caesarean section were more than without section.

Table 1: Incidence of rupture uterus with regard to demographic variables and clinical profile.

Characteristics	No. of cases (N=51)	Percentage
Antenatal care		
Booked	7	13.73
Unbooked	44	86.27
Age in years		
<20	1	1.96
20-30	36	70.59
>30	14	27.45
Gestational age		
<28	1	1.96
28-32	5	9.80
33-36	20	39.21
37-40	25	49.02
Parity		
0	1	1.96
1	18	35.29
2	20	39.21
3	2	3.92
4	4	7.84
5	5	9.80
Inter delivery interval (months)		
>18-24	26	50.98
24-36	15	29.41
>36	10	19.60
Previous section		
With previous section	31	60.78
Without previous section	20	39.21

Table 2: Etiological factors.

| Etiological factors	No. of cases (N=51)	Percentage
Caesarean scar rupture	31	60.78
Multiparity	30	58.82
Fetopelvic disproportion	21	41.17
Oxytocin or other uterotonic	13	25.49
Malpresentation	6	11.76

Clinical feature was extremely variable and most of them presented with more than one feature. Maximum cases presented with signs of shock (Figure 1).

Some patients presented with more than one etiology. Maximum patients had caesarean score rupture (60.78%) followed by multiparity (58.82%) and fetopelvic disproportion in 41.17%.
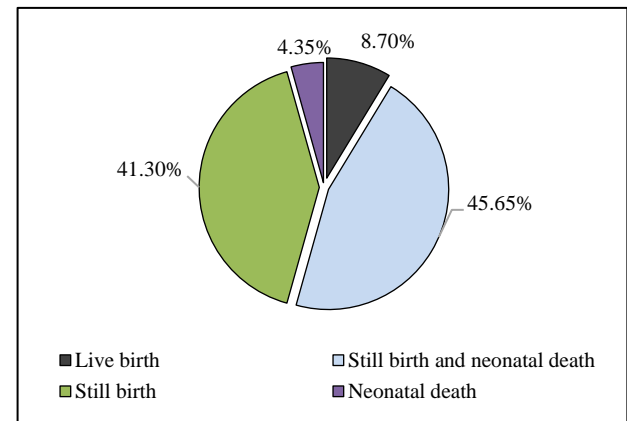
Table 3: Type of surgeries performed.

Surgery	No. of cases (N=51)	Percentage
Repair without bilateral tube ligation	13	25.49
Subtotal hysterectomy	13	25.49
Total hysterectomy	12	23.53
Repair with bilateral tube ligation	11	21.57

Two maternal deaths occurred before operation due to poor general condition at the time of admission.
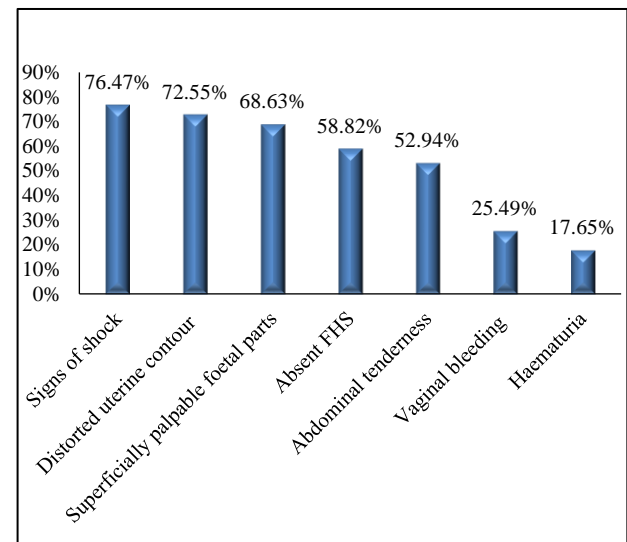
Figure 1: Modes of presentation.

Figure 2: Foetal outcome.

Maternal death rate was 11.63%, whereas perinatal death rate was 82.35%.

DISCUSSION

Rupture uterus is a preventable but potentially life threatening condition which requires prompt diagnosis and treatment. Our hospital is a tertiary care centre, which is a major referral centre for all small hospitals in the radius of 100-150 km and caters to both urban and rural population.

In our study, the incidence of rupture uterus was 0.32%. This is due to increased number of referral from rural areas, mismanagement of high risk patients at the time of labor by inexperienced local midwives due to socio-economic factors, cultural practices like home delivery, and difficult transportation from remote areas. Higher incidence was reported from other developing countries; 0.9% in Nepal, 0.8% in Ghana, 0.76% in Uganda, 0.74% in Pakistan and 0.63% in Yemen.[8-12] The incidence in other Indian studies is comparable to our study varying from 0.061% to 0.28%.[3-7]

Majority of our subjects (70.59%) were in the age group of 22-30 years, mean age being 25.6 years. In a study by Sahu et al in India 73.12% were in the age group of 20-30 years.[14] In another study by Sunitha et al majority were in age group of 26-30 years.[6]

In our study scarred uterus emerged as the most susceptible to rupture. Second gravida with previous caesarean section were the most vulnerable group followed by multiparas with prolonged labor and the use of oxytocics for the induction or augmentation of labor. This is also the pattern seen in other recent Indian studies.[5-7] All the cases were of either term or post term pregnancy. None of the patient with uterine rupture was of preterm.

In this study ruptured uterus was present in 78% of scarred uterus and 22% of unscarred uterus. Similar high incidence of rupture in unscarred uterus was noted in the study by Saini et al.[3] This is due to neglected obstructed labor frequently met in rural areas. 30 cases (58.82%) were multiparous. It was higher than study by Malik et al (42.7%).[4]

Main modality of treatment was total and subtotal hysterectomy. Repair was possible in 24 (47.06%). This is higher than study in Rathod et al (39.2%).[13] It was because many of these cases were referred from remote area and due to delay in arrival their condition deteriorated.

Perinatal mortality was still birth plus neonatal death that is 82.35%. Similar results were found by Rathod et al (90.5%).[13] Maternal mortality was 15.68% in the present study which was higher than Sahu et al (2.76%).[14] Cause for high maternal mortality is arrival of cases in late moribund state of irreversible shock from remote areas.

Unfortunately, uterine rupture cannot be adequately predicted for women wanting a trial of labor following a previous caesarean section. Doctors should review the medical history for risk factors and counsel regarding her relative risks, benefits, alternatives and probability of success. Women should be informed that planned VBAC is associated with an approximately 1 in 200 (0.5%) risk of uterine rupture.

CONCLUSION

In conclusion, uterine rupture is a major contributor to maternal morbidity and neonatal mortality. Four major easily identifiable risk factors are: history of prior caesarean section, grand multiparity, obstructed labor, and fetal malpresentations. Identification of these high risk women, prompt diagnosis, immediate transfer, and optimal management needs to be overemphasized to avoid adverse feto-maternal complications. Extreme caution should be taken when managing patient with a previous uterine scar, attempting a trial of labor. Increased accessibility to good obstetric care and prompt referral system to equipped facilities with availability of transportation services is essential.

REFERENCES

1. Alam IP. Uterine rupture: experience of 30 cases at Faridpur Medical college Hospital. Faridpur Med Coll J. 2012;7(2):79-81.
2. Alam I, Khan A, Ahmed R, Begum N. A two-year review of uterine rupture at gynaecology unit- Ayub teaching hospital. J Ayub Med Coll Abbottabad. 2000;12: 21-2.
3. Saini VK, Yadav PA, Munshi SP, Munshi DS, Marakaja NJ. Study of 30 cases of uterine rupture in teaching institution. Gujarat Med J. 2012;67(2):132-4.
4. Malik HS. Frequency, predisposing factors and feto-maternal outcome in uterine rupture. J Coll Phys Surg Pak. 2006;16:472-5.
5. Sinha M, Gupta R, Gupta P, Rani R, Kaur R, Singh R. Uterine rupture: a seven year review at a tertiary care hospital in New Delhi, India. Indian J Community Med. 2016;41:45-9.
6. Sunitha K, Indira I, Suguna P. Clinical study of rupture uterus- assessment of maternal and fetal outcome. IOSR J Dent Med Sci. 2015;14:39-45.
7. Desai R, Kamat AV. Rupture uterus: a prospective observational study of 25 consecutive cases in a tertiary referral centre in south India. Int J Reprod Contracept Obstet Gynecol. 2017;6:2601-6.
8. Fofie CO, Baffoe P. A two-year review of uterine rupture in a regional hospital. Ghana Med J. 2010;44:98-102.

9. Mukasa PK, Kabakyenga J, Senkungu JK, Ngonzi J, Kyalimpa M, Roosmalen VJ. Uterine rupture in a teaching hospital in Mbarara, Western Uganda, unmatched case-control study. Reprod Health. 2013;10:29.
10. Rizwan N, Abbasi RM, Uddin SF. Uterine rupture, frequency of cases and feto-maternal outcome. J Pak Med Assoc. 2011;61:322-4.
11. Padhye SM. Rupture of the pregnant uterus: a 20 year review. Kathmandu Univ Med J. 2005;3:234-8.
12. Omole-Ohonsi A. Uterine rupture: risk factors and pregnancy outcome. Gynecol Obstet. 2011;1(102):2161-0932.
13. Rathod S, Samal SK, Swain S. Rupture uterus: a 3-year clinical study. J Clin Diagn Res. 2015;9(11):qc04-6.
14. Sahu L. A 10-year analysis of uterine rupture at a teaching institution. J Obstet Gynaecol India. 2006;56(6):502-6.
15. Guise JM, Eden K, Emeis C. Vaginal birth after cesarean: new insights. Evid Rep Technol Assess (Full Rep). 2010;191:1-397.