



RISK FACTORS, FETO-MATERNAL OUTCOMES, MANAGEMENT OPTIONS IN RUPTURE OF GRAVID UTERUS - AN OBSTETRIC CATAclysm

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ABSTRACT

Background: Maternal Morbidity and mortality has been a major World Health Organisation concern over the years. Obstetric hemorrhage is one amongst the leading causes responsible for this. Uterine Rupture is a serious obstetric emergency associated with significant maternal and neonatal morbidity and mortality. The Objective of this paper is to identify the obstetric risk factors, incidence, causes, associated foeto-maternal outcomes and management options in patients of rupture uterus at a tertiary care centre in Mysore– Cheluvamba hospital.

Method: A 3 year retrospective analysis of 28 cases of Uterine Rupture treated in our hospital between December 2019 to December 2022 was done. The case sheets of these patients were analysed and data regarding demographic characteristics clinical presentations, risk factors, management, operative findings, maternal and foetal outcomes, post-operative complications were studied and the data analysed.

Results: The Incidence of uterine rupture was 0.1%. The vast majority of patients were referred from periphery(92.9%) with most common clinical symptom of abdominal pain (32.1%) with a clinical sign of sustained uterine contractions (39.3%). The most common risk factor was previous scarred uterus(67.9%), 46.4% cases underwent total hysterectomy as a management option. There were 3 maternal deaths and 9 cases delivered alive and healthy neonates.

Conclusion: Uterine rupture is a preventable obstetric crisis linked to significant foeto-maternal morbidity and mortality. The main causes are multiparity, obstructed labour, previous cesarean section and late referrals. Identification of these High risk women, Prompt diagnosis, Immediate referral and Optimal management can surely avoid adverse foeto-maternal outcomes.

Key words: Scarred Uterus, Cesarean section, Hysterectomy, Obstructed labour.

INTRODUCTION

Uterine Rupture in pregnancy is an infrequent, but cataclysmic impediment leading to increased incidence of fetal and maternal morbidity and mortality.

Uterine rupture is traditionally defined as the complete separation of all uterine layers and the visceral peritoneum that covers them. It is frequently linked to clinically significant paroxysmal pain, uterine

bleeding, fetal distress, and even the protrusion or expulsion of the fetus and/or placenta into the abdominal cavity. Incomplete rupture is the term used when the peritoneum is still intact ⁽¹⁾.

It is quite uncommon in women with unscarred uteri, with an indicated incidence of only 0.006%, while it has an incidence of less than 1% in women with scarred uteri ⁽²⁾. Over the past few decades, the prevalence of this clinical condition has gradually increased.

Various factors reported in literature, associated with increased incidence of uterine rupture include Uterine anomalies, Multiparity, previous uterine surgeries, fetal macrosomia, fetal malposition, labor inductions, obstructed labour, uterine instrumentations, uterine trauma⁽³⁾.

Delays in diagnosis and treatment result from the non-specific and variable signs and symptoms of uterine rupture. The complications may be serious, encompassing maternal hemorrhage, shock, blood transfusions, hysterectomy, bladder injury, maternal mortality, in addition to fetal prematurity, reduced Apgar scores, and death. The severity of complications majorly depends on time interval between diagnosis and management.

The various management options majorly depend on severity, extent of rupture and general condition of mother. The available options include TAH, STAH, repair of the rupture with or without tubal ligation.

Fortunately uterine rupture is a preventable condition, in-order to reduce maternal morbidity and mortality in our community and meet the Millennium Developmental Goals(MDGs) 4 and 5⁽⁴⁾, It is important to study in-detail about rupture uterus.

AIM

The aim of the present retrospective study is to identify the obstetric risk factors, incidence, causes, associated foeto-maternal outcomes and management options in patients of rupture uterus at a tertiary care centre – Cheluvamba hospital.

MATERIALS & METHODS

This was a retrospective review of data collected for all women managed for uterine rupture during the time period of 3 years between January 2019 – January 2022 at the department of obstetrics and gynecology at Mysore Medical College, Mysore. The data was collected as per the predesigned proforma meeting the objective of the study . This study was approved by the ethical committee of the institution. The case sheets of this patients were analysed and data regarding demographic details, clinical presentation, risk factors, management, operative findings, post-operative complications, maternal and foetal outcomes were studied.

Inclusion criteria

All the cases having complete and incomplete uterine rupture during antepartum and intra-partum period irrespective of prior obstetric history were included in study.

Both referred and registered cases meeting the above criteria were included.

Exclusion criteria

Cases of uterine dehiscence are excluded.

Referred cases of repaired uterine rupture performed elsewhere.

RESULTS

Age in Years	No. of Patients	%
20-25	6	21.4
26-30	10	35.7
>30	12	42.9
Total	28	100.0
Table 1: Age in Years-Frequency distribution of patients studied		
Mean ± SD: 29.25±4.74		

Uterine rupture is more commonly seen in elderly women almost approximately 42.9% of women are of above 30 years of age, The mean range of age to develop uterine rupture is 29.25 years.

Parity	No. of Patients	%
Gravida-1	2	7.1
Gravida-2	11	39.3
Gravida-3	11	39.3
Gravida-4	3	10.7
Gravida-5	1	3.6
Total	28	100.0
Table 2: Parity- Frequency distribution of patients studied		

The frequency of uterine rupture depends on Parity, frequently seen in Multiparous women.

Gestational age	No. of Patients	%
30-36	8	28.6
37-40	16	57.1
>40	4	14.3
Total	28	100.0
Table 3: Gestational age in weeks- Frequency distribution of patients studied		
Mean $\pm$ SD: 37.56$\pm$3.11		

The mean gestational age to develop uterine rupture is during the term of almost 57.1%.It was noted that 14.3% of patients had these complications after 40 weeks period of gestation.

Admission	No. of Patients	%
Booked	2	7.1
Referred	26	92.9
Total	28	100.0
Table 4: Admission- Frequency distribution of patients studied		

Uterine rupture is most commonly seen in referred patients than in booked as booked patients tend to have routine ANC checkups and were told all the warning signs and symptoms at term. Unbooked patients constituted 92.9% of patients.

Clinical Present	No. of Patients	%
Abdomen.Pain	9	32.1
Cessation of labour	0	0.0
Vaginal bleed	7	25.0
Abd.Scar tendernes	3	10.7
Uterine contraction	11	39.3
Palpable foetal parts	5	17.9
Total	28	100.0
Table 5: Clinical Present- Frequency distribution of patients studied		

Among all the types of clinical presentation abdominal pain, followed by persistent uterine contractions and vaginal bleeding were the most common clinical presentations.

Risk Factors	No. of Patients	%
No	1	3.6
Yes	27	96.4
• Prior 1 LSCS	11	39.3
• Prior 2 LSCS	6	21.4
• Prolonged second stage	3	10.7
• Prior H/O uterine rupture	3	10.7
• VBAC	2	7.1
• Failed forceps	1	3.6
• Hyperstimulation	1	3.6
• Multiparity alone	1	3.6
• Placenta accrete	1	3.6
• Prior class CS	1	3.6
• Prior hysterotomy	1	3.6
• Prior myomectomy	1	3.6
• Multiple gestation	1	3.6
Total	28	100.0

Table 6: Risk Factors- Frequency distribution of patients studied

It was noted that vast majority of cases had risk factors associated for uterine rupture to occur, only one case among the lot had no risk factors attributing to uterine rupture.

Previous LSCS is one of the most common risk factor constituting nearly 60.7%. Among this, prior single lscs was a most common factor, as most patients tends to follow sterilization methods after the 2nd delivery in our setting. Prior history of uterine rupture is also an important risk factor noted. Prolonged 2nd stage of labour was surprisingly a significant risk factor in our study(11%).

Two patients who had vbac were later on diagnosed to have uterine rupture. The other risk factors noted in our study were multiparity alone, multiple gestation, prior scarring of uterus due to myomectomy, hysterotomy, classical cesarean section, and hyperstimulation of uterus.

Intra-Op	No. of Patients (n=28)	%
<750 ML	13	46.4
750-1500ML	10	35.7
1500-2000 ML	5	17.9
MORE THAN 2L	0	0.0

Table 7: Intra-Op- Frequency distribution of patients studied

Patients who are presenting with uterine rupture tends to be in hypovolemic shock at the time of presentation, Depending on degree of shock we classified the patients. Most of the patients (46.4%) were in class -1 shock (less than 750ml) till they reached tertiary care centre, who very much could be salvaged. Among the remaining 35% of them were in class-2 hypovolemic shock. The patients who presented in class 3 or more tend to have poor prognosis.

Nature of Rupture	No. of Patients	%
COMPLETE	21	75.0
PARTIAL	7	25.0
Total	28	100.0

Table 8: Nature of Rupture- Frequency distribution of patients studied

The patients who presented with uterine rupture, among these many of the patients (75%) were having complete rupture.

Site	No. of Patients (n=28)	%
Fundal	3	10.7
Lateral wall	1	3.6
Posterior wall	7	25.0
Lower uterine segment	21	75.0
Upper uterine segment	2	7.1
Table 09: Site- Frequency distribution of patients studied		

The site of the uterine rupture is most commonly at lower uterine segment seen in 21 of 28 patients which comes to 75% of total patients. It may be secondary to previous lower uterine segment incision.

Associated Injury	No. of Patients (n=28)	%
Nil	14	50.0
Yes	14	50.0
• Bladder injury	9	32.1
• Broad ligament haematoma	6	21.4
• Colporrhexis	1	3.6
Table 10: Associated Injury- Frequency distribution of patients studied		

The patients who presented with uterine rupture, 50% had associated other injuries like bladder injury, broad ligament hematoma, colporrhexis. Bladder injury was the most common injury noted.

Management	No. of Patients	%
Total hysterectomy	13	46.4
Repair with TL	11	39.3
Concurrent internal iliac artery ligation	5	17.9
Subtotal hysterectomy	4	14.3
Total	28	100.0
Table 11: Management- Frequency distribution of patients studied		

Almost 46% of the patients underwent total hysterectomy as management option. 11 patients underwent repair of the uterus with concurrent tubal ligation. It was noted that there was a requirement for concurrent internal iliac artery ligation to control PPH in 17.9% of patients. 4% underwent subtotal hysterectomy.

Duration of Surgery (hrs)	No. of Patients	%
≤1	9	32.1
>1	19	67.9
Total	28	100.0
Table 12: Duration of Surgery (hrs)- Frequency distribution of patients studied		
Mean ± SD: 1.32±0.33		

It was noted that mean duration of surgery was more than 1 hour in majority (67.9%) of patients for hemodynamic resuscitation, stabilization and management which lead to increased morbidity.

Hospital Stay(days)	No. of Patients	%
1-7	10	35.7
8-14	9	32.1
>14	9	32.1
Total	28	100.0
Table 13: Hospital Stay(days)- Frequency distribution of patients studied		
Mean $\pm$ SD: 11.43$\pm$5.13		

The duration of hospital stay is also one of the significant indicators of morbidity and the economical burden on the patients family. It was noted that 1/3 rd of the patients had to stay in the hospital for more than 14 days (including ICU, HDU and WARDS).

Post-Op Complication	No. of Patients (n=28)	%
Nil	7	25.0
Yes	21	75.0
• Blood transfusions	18	64.3
• ICU admissions	15	53.6
• MODS	4	14.3
• SEPSIS	2	7.1
• Maternal death	3	10.7
Table 14: Post-Op Complication- Frequency distribution of patients studied		

Inspite of early diagnosis, prompt decision making and management ,it was unfortunate that 3 maternal deaths were noted constituting to the high burden of maternal mortality. 14% had developed Multi organ dysfunction, 7.1% had sepsis, 53.6 % had ICU admissions, leading to high burden of maternal morbidity.

Fetal Complications	No. of Patients	%
alive and healthy	9	32.1
Asphyxia with survival	9	32.1
IUD	8	28.6
Still birth	2	7.1
Total	28	100.0
Table 15: Fetal Complications- Frequency distribution of patients studied		

It was re assuring that 32.5% of the babies were alive and healthy but the same number if babies were asphyxiated owing to delay in diagnosis and referral. It was unfortunate that 28.6% of the babies succumbed to death intra-uterine.

DISCUSSION

Our study is conducted in a tertiary care centre which is a major referral centre for high risk pregnancies, which caters both urban and rural population. The incidence of uterine rupture was 0.1% which is significantly less when compared to other developing countries like 0.8% in Ghana, 0.75% in Uganda, 0.74% in Pakistan, 0.9% in Nepal, 2.8% in Euthopia. This is mainly because of the Health care workers efforts in identifying the risk factors, warning signs and symptoms of Uterine rupture and also strengthening of Primary Health Care centres about the same leading to early referral of cases. Proper selection of cases for TOLAC is an important decision in preventing further complications.

Majority of the women in study were in the age group >30 years,emphasizing the fact that the greater age group has higher complications. This is contrary to majority of studies where mean age group was 25- 29 years.In study by sunita k et⁽⁵⁾ al mean age group noted was 26-30 years.

Marwah et al⁽⁶⁾ noted multiparity was another risk factor for this complication which is similar to our study, most of the cases of uterine rupture were noted after 37 weeks. You et al and bereka et al⁽⁷⁾ found highest ruptures at >30 weeks and >37 weeks respectively.

Like in any other study it was noted that unbooked patients constituted the bulk of the cases, pointing out the need for awareness among public about routine antenatal visits and care.

As uterine rupture can majorly be diagnosed by clinical presentation; majority had severe abdominal pain, persistent uterine contractions and vaginal bleeding as the presenting complaints. Revicky et al⁽⁸⁾ stated that prolong and persistent foetal bradycardia is the most common indicator for uterine rupture.

In 75% of our cases; rupture was complete involving the lower uterine segment similar to desai et al⁽⁹⁾ study where the complete rupture noted to be 84%. Anterior wall was the common site of rupture in 84.4% of scarred uterine ruptures in a study done by Al Saleem M H et al⁽¹⁰⁾.

The most common risk factors noted in our study were prior scarred uterus- either prior one,two LSCS, hysterotomy, myomectomy, classical cesarean scetion similar to all studies. This emphasizes the fact that there is need for reduction of primary cesarean sections which overall reduces the maternal morbidity majorly. There is a need to audit all the cesarean sections at the institutional level. Prolonged second stage was a significant risk factor noted in our study unlike other studies. Individualized care and proper monitoring of labour can easily prevent this complication.

In almost 46% of patients total abdominal hysterectomy was done as a management option; contrary to Marwah et al⁽⁶⁾ where 2/3rds underwent repair by tubal ligation to minimize the blood loss and operative time. However in our setting hysterectomy was felt to be the best management option similar to Desai et al⁽⁹⁾ It was surely noted that duration of surgery was increased in 67.9% of patients leading to morbidity.

In our study 64.3% required blood transfusions mainly owing to increased blood loss during surgery and antenatal anaemia in our population. Here comes the importance of regular ANC visits where optimizing hemoglobin plays an important role.

It was very unfortunate that 3 maternal deaths were noted in the study. According to a WHO⁽¹¹⁾ systematic assessment of maternal morbidity and death, the prevalence of a ruptured uterus varied from 0.006% in industrialized countries to 25% in least developed ones. The majority of research indicated that maternal death ranged from 0 to 5.9% and fetal mortality from 56.85% to 94.74%.

CONCLUSION

One of the disorders that can be prevented and treated is the rupture of the gravid uterus, which is a fatal surgical consequence with significant fetal and maternal morbidity and death. Regular antenatal visits, optimization of pre-delivery hemoglobin levels, alertness among healthcare givers, early diagnosis and referral, good transportation facilities, good intrapartum monitoring, adequate manpower are the few strategies which play an important role in preventing this catastrophe. The results of our study showcases the major maternal and fetal morbidity and mortality associated with ruptured uterus, it also emphasizes the importance of these strategies.

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