

Rupture Uterus: Incidence and Causes - A Three Years Retrospective Study

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Abstract

Background Uterine rupture is defined as a full-thickness separation of the uterine wall and the overlying serosa. The purpose of this study was to evaluate the incidence of rupture uterus and the factors associated with it in our institution. **Methods** This is a retrospective study in GMC Jammu of three years of patients admitted with rupture uterus from January 2018 to December 2020. The data was analysed to study the incidence and the factors related to it. **Results** During the study period of 3 years, there were 46 cases were of rupture uterus among 63708 deliveries giving incidence of 0.7/1000 deliveries. Among the risk factors, previous cesarean section was the most common risk factors associated with 60.86% of the case followed by multiparty (>3) in 47.82% and obstructed labour in 32.60% cases. Most cases (65.21%) underwent hysterectomy (subtotal or total) followed by uterine repair with or without bilateral tubal ligation. There was high maternal morbidity and perinatal mortality (82.6%). **Conclusions** Cesarean section was the major risk factor of rupture uterus. Careful selection and intensive monitoring of VBAC cases and timely cesarean sections should be done to decrease incidence of rupture uterus.

Key Words

Rupture Uterus, Etiology, Previous Cesarean

Introduction

Uterine rupture is defined as a full-thickness separation of the uterine wall and the overlying serosa. It is a rare peripartum complication and is associated with severe maternal and neonatal morbidity and mortality. ^[1,2] Maternal mortality ranged between 1% and 13%, and perinatal mortality between 74% and 92%. ^[3] The prevalence varies in different countries. Globally, the incidence of uterine rupture is 0.07%. ^[4] In developed countries with previous cesarean section it is around 1%

and in women without previous cesarean it may be as low as < 1 per 10000. ^[3] It is a leading cause of maternal mortality in developing countries despite current knowledge. ^[5]

The various causes associated with rupture uterus are previous cesarean sections, hysterectomy or myomectomy, metroplasty, multiparty, obstructed labour, previous curettage, handling by dais, uterine anomalies, uterine instrumentation, injudicious use of oxytocics, and

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uterine trauma. [6,7]

Maternal complications constitute haemorrhage, shock, bladder injury maternal death. Foetal complications constitute intrauterine foetal death, asphyxia and admission to neonatal ICU.

Management constitutes supportive care and resuscitation of hypovolumic shock. [8] Surgical management includes rapid delivery of the foetus followed by either repair of the rupture or hysterectomy. Surgical treatment depends upon the type and extent of rupture, mother's parity and desire for further childbearing [9], degree of haemorrhage and mother's general condition. Hysterectomy is the treatment of choice in case of multiparous woman non-desirous of future child bearing and in cases of intractable haemorrhage. In fact, rupture uterus is one of the most common indications for peripartam hysterectomy. [10,11,12]

If the defect is small and patient is stable, then the surgical management constitutes repair of defect with or without bilateral tubal ligation. Repeat cesarean has to be done at 36 weeks in patients with previous uterine rupture in pregnancy. [13]

Material and Methods

This is a retrospective study in GMC Jammu of three years of patients admitted with rupture uterus from January 2018 to December 2020.

After taking ethical clearance from the ethics committee of GMC Jammu Registration number C-101, the data was collected from laparotomy registers and census papers of the last three years for the incidence and files of the cases for the delivery details and perinatal outcome. All the cases of rupture uterus - complete and incomplete were noted.

Their sociodemographic data was analysed.

The data noted was age of the patient, parity, period of gestation, risk factors, any history of handling by dai, type and location of rupture, type of surgical management,

postoperative complications and maternal and foetal outcome. All the data was analysed using statistical analysis and the incidence and causes were found out.

Results

During the study period of 3 years, there were total of 63708 deliveries among which 46 cases were of rupture uterus giving incidence of 0.7/1000 deliveries.

Among the demographic data, 25-30 years was the predominant age group (43.47%) and parity of 1 & 2 was most common (52.16 %). Maximum cases presented at 37-40 weeks gestation (56.52%). Majority (56.52%) had no antenatal check up.

Among the risk factors, previous cesarean section was the most common risk factors associated with 60.86% of the case followed by multiparty (>3) in 47.82% and obstructed labour in 32.60% cases. Handling by dai (midwife) and previous curettage were the other causes. Among the intraoperative findings, most common finding was broad ligament haematoma seen in 28.26% cases followed by scar rupture (26.08%) and posterior wall rupture (26.08%). Other findings were extension to lower segment, extension to upper and lower segment both and associated bladder injury.

Patients were managed with immediate resuscitation with intravenous fluids and blood transfusions, antibiotics and immediate laparotomy. Most cases (56.52%) underwent subtotal hysterectomy followed by uterine repair with or without bilateral tubal ligation.

Maternal morbidity observed was requirement of blood transfusion in 86.95% patients followed by anaemia in 78.26% cases and shock in 65.21% cases. Other complications noted were fever (36.95%), wound infection (21.73%), ICU admission (13.04%) and mortality in 4.34% cases.

Among the foetal outcome, 65.21% were intrauterine deaths whereas 17.39% had Apgar score <4/10 and rest were live foetuses. Total perinatal mortality was 82.6%.

Table 1 . Demographic Data Associated with Rupture Uterus

| Variables | | Number | Percentage |
|----------------|--------------------|--------|------------|
| Age | 20-25 years | 12 | 26.08% |
| | 25-30 years | 20 | 43.47% |
| | 30-35 years | 8 | 17.39% |
| | 35-40 | 6 | 13.04% |
| Parity | Primigravida | 0 | 0% |
| | 1 | 12 | 26.08% |
| | 2 | 12 | 26.08% |
| | 3 | 9 | 19.56% |
| | 4 | 7 | 15.21% |
| | 5 | 6 | 13.04% |
| Gestation age | 28-32 weeks | 3 | 6.52% |
| | 33-36 weeks | 7 | 15.21% |
| | 37-40 weeks | 26 | 56.52% |
| | >40 weeks | 10 | 21.73% |
| Antenatal care | no check-up | 26 | 56.52% |
| | Irregular check-up | 14 | 30.43% |
| | Regular check-up | 6 | 13.04% |

Table 2. Risk Factors Associated with Rupture Uterus

| Risk Factors | Number | Percentage |
|--------------------|--------|------------|
| Previous LSCS | 28 | 60.86% |
| Multiparity (>3) | 22 | 47.82% |
| Obstructed labour | 15 | 32.60% |
| Handling by dai | 8 | 17.39% |
| Previous curettage | 6 | 13.04% |

Table 3. Intraoperative Findings During Laparotomy

| Inter-operative findings | Number | Percentage |
|--------------------------------------|--------|------------|
| Scar rupture | 12 | 26.08% |
| Extension to lower segment | 8 | 17.39% |
| Extension to upper and lower segment | 8 | 17.39% |
| Bladder injury | 8 | 17.39% |
| Broad ligament haematoma | 13 | 28.26% |
| Posterior wall rupture | 12 | 26.08% |

Table 4 - Surgical management of cases of rupture uterus

| Surgical Management | Number | Percentage |
|---|--------|------------|
| Repair with bilateral tubal ligation | 8 | 17.39% |
| Repair without bilateral tubal ligation | 8 | 17.39% |
| Subtotal Hysterectomy | 26 | 56.52% |
| Total hysterectomy | 4 | 8.69% |

Discussion

The incidence of rupture uterus in our hospital was found to be 0.7/1000 deliveries. Different studies have shown the incidence of rupture uterus to vary from 0.3/1000 ^[14] to as high as 11/1000. ^[15] High incidence was also noted in study by Mahababu *et al* (0.83%) ^[16] and Gupta (3%).

^[17] The low incidence in our study was due to good obstetric care and prompt and timely action of the admitted well as referred patients in our hospital.

Most of the cases (43.47%) belonged to the age group of 25-30 years which was similar to the studies by Gupta B *et al* (47%) and Sunita *et al* (50%) ^[17,18] Parity of 1 &

Table 5. Maternal Morbidity Associated with Rupture Uterus

| Maternal Morbidity | Number | Percentage |
|------------------------|--------|------------|
| Shock | 30 | 65.21% |
| Anaemia | 36 | 78.26% |
| Blood transfusion | 40 | 86.95% |
| ICU admission | 6 | 13.04% |
| Wound infection | 10 | 21.73% |
| Fever | 14 | 36.95% |
| Vesico vaginal fistula | 0 | 0% |
| Mortality | 2 | 4.34% |

Table 6 - Foetal Outcome Associated with Cases

| Foetal Outcome | Number | Percentage |
|----------------------|--------|------------|
| Live | 8 | 17.39% |
| Apgar Score <4/10 | 8 | 17.39% |
| Intrauterine death | 30 | 65.21% |
| Early neonatal death | 8 | 17.39% |
| Perinatal mortality | 38 | 82.6% |

2 was the most common (52.16%) indicating previous cesarean scar as a major risk factor for rupture uterus. This was similar to the study by Gupta *et al.*^[17] Most of the patients were without antenatal check up or irregular check-ups (86.95%) similar to the study by Gupta *et al* (87.5%).^[17] 37-40 weeks was the most common period of gestation for rupture uterus (56.52%). Gupta *et al*^[17] also showed that the incidence of rupture uterus was highest in the gestation age of 37-40 weeks (62.5%). Among the factors for rupture uterus, previous cesarean section the most common risk factor associated with 60.86% of the cases followed by multiparty (>3) in 47.82% and obstructed labour in 32.60% cases.^[18] Handling by dai (midwife) and previous curettage were the other causes. Similar studies by Chibber *et al*^[14] and Vidyarthi *et al*^[19] found the incidence of rupture uterus in 52% and 59.7% with previous cesarean scars respectively whereas study by Diab^[15] in Yemen showed that incidence to be 71.7% in unscarred uterus. Similar high incidence of ruptured uterus in unscarred uterus was also noted in study by Saini *et.al.*^[20] The risk factors are different in different parts of the world depending on the obstetric challenges of that place. Whereas previous cesarean is a risk factor in tertiary hospital like ours,

multiparty with neglected obstructed labour with history of handling by midwife at home is more common in rural areas.

Patients were managed with immediate resuscitation with intravenous fluids and blood and all underwent laparotomy. Most cases (56.52%) underwent subtotal hysterectomy and 8.69% underwent total hysterectomy followed by uterine repair (34.78%) with or without bilateral tubal ligation. Studies by Vidyarthi *et al*^[19] and Rathod *et al*^[21] also showed that repair was possible in 29.8% and 39.2% respectively.

Maternal mortality was 4.34% in our study whereas in study by Vidyarthi A *et al* (19) it was 3.5% and in that by Sahu *et al*^[22] it was 2.76%. The incidence of perinatal mortality was 82.6%. Others studies have also reported high incidence of perinatal mortality of >80%.^[15,19,21]

Conclusion

Rupture of uterus is a grave obstetric complication which is associated with high maternal morbidity and is almost always fatal for the foetus. Major risk factor in urban setting is previous cesarean sections and in rural areas is multiparty. Both can be managed with regular antenatal check ups and timely hospital delivery.

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Conflicts of Interest

There are no conflicts of interest.

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