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Original Research Article

Uterine rupture: review of cases from tertiary care centre in India

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ABSTRACT

Background: Uterine rupture is rare catastrophic complication associated with high incidence of maternal and perinatal morbidity and mortality. This study aimed at assessing the incidence of uterine rupture; maternal and fetal outcomes in cases of uterine rupture and factors associated with it.
Methods: This retrospective study was carried out in the department of obstetrics and gynaecology, Late Baliram Kashyap memorial government medical college and Shaheed Mahendra Karma memorial hospital, Bastar, Chhattisgarh, India. All the cases of rupture uterus, who were admitted with the diagnosis or who had rupture during their stay in our hospital during the study duration of July 2018 to March 2020 were included in our study- 37 cases.
Results: Out of 37 cases of ruptured uterus 8 rupture occurred in women with prior lower segment caesarean section (LSCS) and 29 occurred in women without prior LSCS. There were equal numbers of cases (17 cases each, 45.9%) in the age groups 25-30 years and 31 years and above. Incidence of rupture was highest in multiparous (3 and above). 70.3% of rupture were un-booked patients. 89.2% were referred from periphery. 86.5% of ruptures occurred at more than 37 weeks. 54% of rupture had of inter pregnancy interval of less than 24 months. Most common predisposing factor for uterine rupture in our study was obstructed labor. The most common site of rupture was found to be anterior surface of lower segment of uterus. Maternal morbidities seen include need for blood transfusion in 94.5% of cases. Among the maternal morbidities noted, severe anemia requiring blood transfusion was most commonly observed.
Conclusions: Rupture of the pregnant uterus should be looked as a preventable entity. All possible efforts to reduce the incidence and the resultant maternal morbidity and mortality due to uterine rupture should be undertaken.

Keywords: Uterine rupture, Maternal outcomes, Fetal outcomes

INTRODUCTION

Rupture uterus is defined as full thickness disruption of uterine wall that involves the overlying visceral peritoneum. Rupture may be primary defined as occurring in a previously intact or unscarred uterus or may be secondary associated with pre-existing myometrial incision, injury or anomaly.[1] Uterine rupture is a rare but catastrophic complication associated with high incidence of maternal and perinatal morbidity mortality. It is one of the most serious preventable obstetrical emergencies. Maternal health has long been the cornerstone in public health. As per the sample registration system report by Registrar General of India it is heartening that the maternal mortality ratio has declined from 130 in 2014-2016 to 113 in 2016-18. But in rural areas like Bastar the harsh reality of uterine rupture cases and mortalities due to the same remains a challenge. Analysis of the world health organization multicountry survey on maternal and newborn health suggest women with uterine rupture had significantly higher risk of maternal death and perinatal death.[2]

Maternal mortality due to rupture uterus vary from 0-1% in developed countries to 5-10% in developing countries.[3,4]

Among the pregnant women, uterine rupture can be seen in those who have a myometrial scar from previous surgery (commonly a caesarean section) and those with an unscarred uterus. Though rupture in a scarred uterus is more common, the rupture of an unscarred uterus causes significantly more maternal and neonatal morbidity[3]. Several contributory factors in rupture have been identified which include grand multiparity, teen-age pregnancy or old primigravida, illiteracy or poor socio-economic status and resultant lack of antenatal care, poor access to emergency obstetric care, injudicious obstetric interventions/manipulations or unsupervised labor, contracted pelvis, malpresentations, obstructed labor, difficult operative vaginal delivery[4,5]. Ruptures involving unscarred uterus can also be attributed to trauma and genetic disorders associated with uterine wall weakness Ehlers-Danlos and Loeys-Dietz.

As per latest research from the world health organization, caesarean section use continues to rise globally from 7% in 1990 to 21% today.[6] Consequently, the number of deliveries by mothers with prior caesarean section is also on the rise. Though caesarean sections are absolutely critical to save lives in situations where vaginal deliveries would pose risks, they do come with some inherent risks and rupture uterus is one of them. The risk factors identified for rupture in women with prior caesarean section include prior classical incision, induction or argumentation of labour, macrosomia, post-term delivery, increasing maternal age, short maternal stature, prior periviable caesarean section and no prior vaginal delivery, a short interconception interval.[7-10] In developed countries, previous caesarean section is the primary risk factor for rupture uterus during a trial of labor after caesarean delivery (TOLAC). In developing countries like India, uterine rupture even in unscarred uterus is common, reflecting poor health care especially in rural areas. This study aims to assess the incidence of uterine rupture at a tertiary teaching hospital, associated factors and maternal fetal outcomes in cases with uterine rupture.

Aim and objectives

Aim and objectives of current study were to evaluate the incidence, patient profile and associated risk factors, consequences of uterine rupture on maternal and perinatal outcomes and to identify and recommend preventable measures applicable in our area.

METHODS

Study setting

This an institutional-based retrospective study was carried out in the department of obstetrics and gynecology, Late Baliram Kashyap memorial government medical college and Shaheed Mahendra Karma memorial hospital, Bastar, Chhattisgarh, India. Our institute happens to be the only terminal referral center in the radius of 300 kilometers for both rural and urban population in the civil-strife affected districts of Bastar, Narayanpur, Dantewada and Bijapur.

Study population

All the cases of rupture uterus, who were admitted with or who had rupture during their stay in our hospital during the study duration of July 2018 to March 2020 were included in our study.

Case definition

Uterine rupture was defined as separation of the entire thickness of uterine wall that also involves the overlying visceral peritoneum. The cases were diagnosed clinically, by ultrasound or during the surgery.

Data collection procedure

The records of mothers with uterine rupture, managed at our institute during the study duration were retrieved. Detailed history from patient and/or attendant taken on admission regarding the demographic data, past obstetric events, details regarding the present pregnancy and details of events preceding the rupture were analyzed. Predisposing factors for rupture were identified based on their history and medical records. Information regarding intrapartum care before referral, time taken to reach our institution and the reason for any delay was also analyzed. Data about the mode of clinical presentation, type of rupture, the management and maternal and fetal outcome in detail including the operative findings regarding site and type of rupture, hemoperitoneum and other associated injury to the adjacent organ was also noted. Details of management including primary repair of the uterus with or without tubal ligation or hysterectomy depending upon condition of the patient at the time of presentation, type, severity and extent of rupture were noted. Maternal complications, blood loss, transfusion requirements were also analyzed.

RESULTS

The total of 37 cases of ruptured uterus were seen during the study duration of July 2018 to March 2020. The total number of deliveries during the same period were 7108, therefore the incidence of rupture was recorded to be 0.52%.[11-18] Out of 7108 deliveries, 1527 were by cesarean section. The total number of cesarean sections with prior cesarean section were 610. Out of 37 cases of ruptured uterus, 8 ruptures occurred in women with prior cesarean section and 29 occurred in women without prior cesarean section. There were equal numbers of cases (17 cases each, 45.9%) in the age groups 25-30 years and 31 years and above (Figure 1). Lowest percentage was seen among the age group 21-25 years (8.10%).

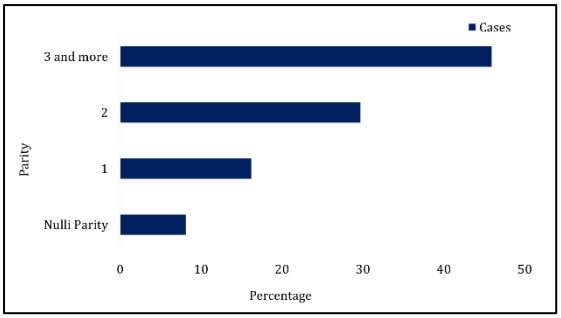

Figure 1: Profile of patients: parity.

Incidence of rupture was highest in multiparous (3 and above) with 17 cases (45.9%). Only 3 cases (8.1%) of rupture were found among nulli parous women (Table 1, Figure 2). 26 cases (70.3%) of rupture were un-booked patients, only 29.7% cases were booked cases. 33 cases (89.2%) were referred from periphery. 4 cases (10.8%) of rupture occurred while the patient was in trial of labour at the institution (Figure 2).

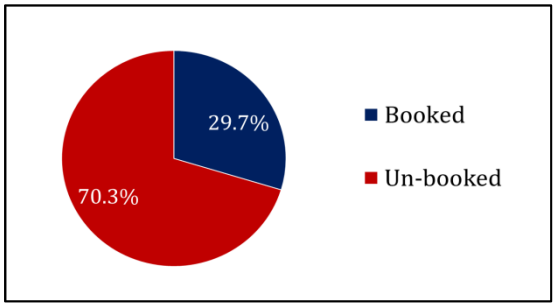

Figure 2: Profile of patients: booking status.

Maximum number of ruptures occurred beyond 37 weeks (32 cases, 86.5%). 5 cases (13.5%) of rupture were seen in pre term patients (Figure 3).

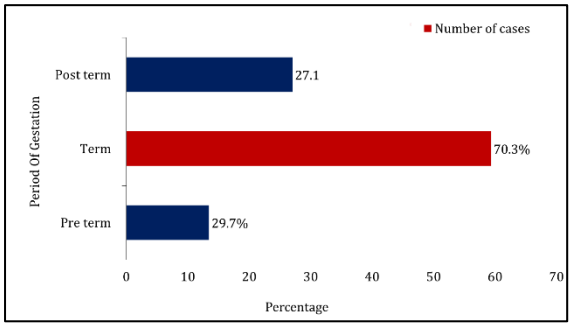

Figure 3: Profile of patients: period of gestation.

Total 20 cases (54%) of rupture had of inter pregnancy interval of less than 24 months and 17 cases (46%) had more than 24 months. 17 cases (46%) of rupture uterus had fetal weight >3 kg, while 14 cases (37.8%) had between 2.5-3 kgs and 6 cases (16.2%) had less than 2.5 kgs.

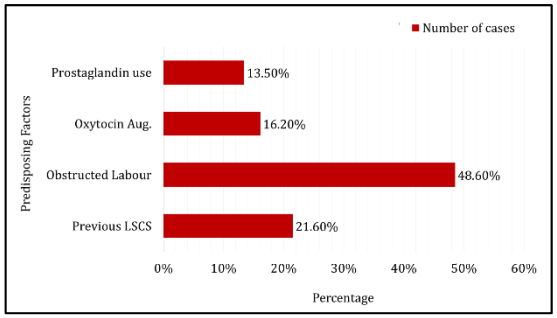

Figure 4: Predisposing factors.

Table 1: Profile of patients: age.

Age (years)	N	%
21-25	3	8.10
26-30	17	45.9
31 and above	17	45.9

Table 2: Profile of patients: parity.

Parity	N	%
Nulli Parity	3	8.10
1	6	16.2
2	11	29.7
3 and more	17	45.9

Table 3: Rupture characteristics.

Site of rupture	Without previous scar	With previous scar
	N	N
Lower uterine segment		
Anterior wall	24	5
Posterior wall	6	1
Right lateral wall	5	1
Left lateral wall	18	4
Upper uterine segment		
Anterior wall	8	2
Posterior wall	2	1
Right lateral wall	1	2
Left lateral wall	6	2
Fundus	1	0
Extension to other organs		
Bladder	8	5
Cervix	15	4
Vagina	9	2
Round ligament	3	1
Broad ligament	6	2

Most of the ruptures were diagnosed clinically and majority of them showed signs and symptoms of absent FHS, palpable fetal parts, maternal tachycardia, prolonged labour, vaginal bleeding, altered uterine contractions, distorted uterine contour and hematuria. From the time of referral, average time taken to reach the

medical college was 5±3.2 hours. In most of the cases delay was attributed to patient taking time after referral or remote location of primary health center, needing longer time to reach the tertiary care center. Most common predisposing factor for uterine rupture in our study was obstructed labor (18 cases, 48.6%). Second most common cause was previous LSCS (8 cases, 21.6%). Other were inadvertent use of Oxytocin (6 cases, 16.2%) and Prostaglandin (5 cases, 13.5%) (Figure 4).

Table 4: Type of surgical management.

Variables	N	%
Repair only	5	13.5
Repair with TL	29	78.4
Obstetric hysterectomy	3	8.1

Table 5: Post-operative complications.

Parameters	N	%
Anemia/BT	35	94.5
Pyrexia	14	37.8
Wound infection	18	48.6
Paralytic ileus	11	29.7
Burst abdomen	11	29.7
VVF	7	18.9
Prolonged stay (>8 days)	30	81.0
Ventilator support	2	0.5
DIC	2	0.5
Maternal mortality	3	0.8
Fetal death	37	100

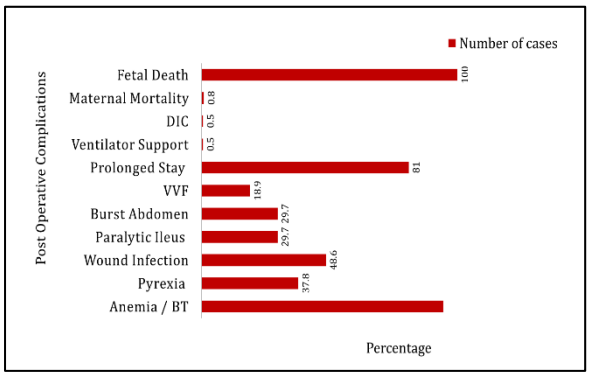

Figure 5: Post–operative complications.

The most common site of rupture was found to be anterior surface of lower segment of uterus, but often upper segment was also involved along with it (Table 3). Upper segment was more commonly involved in patients of rupture without prior LSCS. Left lateral wall was more commonly than right lateral wall involved in both with or without previous scar cases. The associated internal injuries with rupture were injury to bladder in 13 cases, while cervix was involved in 19 cases, extension to vagina was seen in 11 cases, round ligament and broad ligament were involved in 4 and 8 cases respectively (Table 3). Surgical treatments performed were uterine rupture repair, done in 13.5% of the cases, repair with tubal ligation was done in 78.4% of cases and 3 obstetric hysterectomies were performed (8.1%) (Table 4). Maternal morbidities seen include need for blood transfusion in 94.5% of cases, wound infection in 48.6% of cases, vesico-vaginal fistula (VVF) in 18.9% of cases. There were 3 maternal mortalities and none of the fetuses were alive in our study (Figure 5, Table 5).

DISCUSSION

As observed in the study uterine rupture is a serious maternal complication with a high maternal and foetal morbidity and mortality especially in the remote areas. The incidence reported in other Indian studies ranges between 0.061% to 0.28%.[5-8] In our study the incidence of uterine rupture was found to be 1 in every 192 deliveries (0.52%) which was slightly higher than the other Indian studies.[9] Reasons of higher incidence can be attributed to this being a tertiary centre with high-risk cases and suspected rupture uterus cases being referred to our centre. Other possible reasons can be poor antenatal coverage and delay in referrals. The most women with rupture were in the age group of 26-35 years in our study. Similar findings were also found in other studies as it is the age of maximum fertility. In study by Sahu et al 61.53% were in the age group of 26-30 years; 73.12% were in the age group of 20-30 years in study by Sahu et al in study by Khan most women belonged to age group of 31-35 years (47%).[8,11]

Majority of the women were unbooked and multiparous. In our study 91.8% women were para 1 and above; with as much as 45.9% being para 3 and above. Similar results were found in other studies.[9] In study by Sahu et al 75.26% were para 1-3; in study by Sahu et al. 82.5% were para 1-3.[8,11] In study by Ezechi et al 50.8% were grand multi para, comparable to 45.9% in our study.[12] Majority of women were unbooked and had unsupervised labour. Similar findings were found in other studies.[10] Majority of women were term (70.3%), followed by post-term (27.1%). This, in comparison to a study by Desai et al where 84% term and 16% post-term pregnancies had rupture uterus and none of the patients were pre-term.[10] We would like the readers to note, majority of the patients did not know the exact expected date of delivery EDD (by LMP or by ultrasound), hence it was difficult to determine if the patients were term or post term. This can also be regarded as a contributory factor since the EDD might have well crossed without the patient knowing it. Out of 37 cases, 33 cases (89.2%) came to our institute with complications. This reflects an aversion in rural populations to the institutional delivery and they came to hospital only after failure of efforts to vaginal delivery at home. Some patients were also referred after what seemed to be a prolonged trial of labour at periphery (PHC or CHC). Out of 4 patients who had rupture uterus in institute, 2 were grand multipara developing hyper contractions with prostaglandin, used for induction, while 1 patient was under VBAC trial and the other was a

referred case with prolonged labour who ruptured soon after coming to us. These findings are comparable to studies of Sunita et al and Sahu et al.[6,8] Induction of labour has been documented to increase the risk of uterine rupture, approximately 1% with oxytocin use and 2% with vaginal prostaglandins.[13] The most common predisposing factors reported in literature are multiparity, obstetrical trauma, foetal macrosomia and malpresentation. In our study the most common predisposing factor was obstructed labour.[7] Among the patients studied by us, the most common site of rupture was found to be anterior surface of lower segment of uterus; similar findings were noted in other Indian studies.[8,10] Repair of uterine rupture was most commonly performed surgical management for patients in our study, similar management was noted in study by Sahu et al and Gupta et al while in the study by Desai et al subtotal hysterectomy was the most commonly performed management in cases of uterine ruptures.[7-10] As described in the literature, the best procedure for a patient with rupture uterus is the one which takes least amount of time, does not aggravate the patients state of shock and gets her off the operating table in best possible condition.[14] So, we recommend Repair of uterine rupture wherever possible and feasible. Among the maternal morbidities noted, severe anaemia requiring blood transfusion was most commonly observed. Pyrexia and wound infection were other commonly observed post operative complications. Among the thirteen women who had associated bladder rupture, seven developed vesico vaginal fistula. Tragically, the perinatal outcomes were with grave consequences, all 37 (100%) were stillbirths. 3 (8.01%) mothers succumbed during the treatment due to various causes, most common being hypovolemic shock, and severe anaemia Similar findings with respect to maternal and perinatal outcomes were noted in study by Astatikie et al, Chuni et al, Diab et al, Rashmi et al proportion of maternal mortality was 13.5%, 1.7%, and 3.33% respectively.[16-18] Failure to diagnose the rupture at the referral centres and arrival at the tertiary centre in a moribund condition also contributed to the maternal mortality morbidity and perinatal mortality.

Limitations

Since the study is retrospective, limited amount of data that was previously documented as part of the treatment protocol was used for the study. A well-designed prospective study done in the future will alleviate the limitations of this study.

CONCLUSION

Our study concludes, uterine rupture is a serious maternal complication with a high maternal and foetal morbidity and mortality, with high incidence especially in the remote areas. Rupture of the pregnant uterus should be looked as a preventable entity. We recommend, need for increasing awareness among our population about antenatal, peripartum and postnatal care. of High-risk cases should be identified, especially women with previous caesarean section and educating them regarding need for proper antenatal care and supervised institutional delivery. Early presentation and timely referral, facilities for blood and blood products transfusion, availability of qualified obstetrician & anaesthetist to reduce the morbidity and mortality in cases with rupture of uterus should be ensured. TOLAC should be conducted under vigilant care of qualified obstetrician in a well-equipped and adequately staffed facility with strict intrapartum monitoring; since a failed TOLAC results in higher maternal morbidity. Training of skilled birth attendants working at peripheral centres for the use of partograph to ensure timely attention and referrals of patients. All possible efforts to reduce primary caesarean births. Increasing accessibility to quality obstetric care, strong referral system and transportation facilities to decrease maternal and neonatal mortality.

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