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Material & Methods: This was a retrospective study done in the department of obstetrics & gynaecology during September 2017 to August 2018. Data was collected from the registers of labour room, labour OT and medical records department of RIMS, Ranchi. Total cases of rupture uterus cases during the study period were included in the study. There was no exclusion criteria. Incidence of rupture uterus per 1000 deliveries was calculated.

Observation & Result: In our study, the incidence of rupture uterus was 10 per 1000 deliveries. All 70 cases were unbooked, had rupture outside RIMS; 60 (85.7%) were referred case ,whereas 10 (14.37%) had no referral paper. 47 (67.1%) had rupture of previous cs scar, others were non scarred uterus. 57 (81.4%) had rupture of lower uterine segment, whereas 13 (18.6%) had upper segment rupture. 11 (15.7%) had undergone repair of the uterus without tubectomy, 20 (28.6%) had repair with tubectomy.

Keywords: rupture uterus, maternal mortality, maternal morbidity, hysterectomy, previous cesarean, unbooked case, tertiary care hospital.

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Rupture Uterus in a Tertiary Care Centre: A Retrospective Study

Meetali Parashar [α], Meena Mehta [σ] & Anupama Kumari [ρ]

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Conclusion: Rupture uterus is an important cause of maternal and fetal morbidity - mortality. Incidence of rupture uterus can be reduced through effective and quality antenatal checkup, institutional VBAC, delivery by skilled healthcare providers and timely referral of cases like cephalopelvic disproportion, obstructed labour prolonged labour and malpresentation.

Keywords: rupture uterus, maternal mortality, maternal morbidity, hysterectomy, previous cesarean, unbooked case, tertiary care hospital.

I. Introduction

Disruption in the continuity of all the uterine layers (endometrium, myometrium and serosa) any time beyond 28 weeks of pregnancy is called rupture of the uterus. The prevalence widely varies from 1 in 2,000 to 1 in 200 deliveries. During the past few decades, the prevalence has been found to be almost static. Whereas improved obstetric care reduces the rupture from obstructed labor but there has been increased prevalence of scar rupture following increased incidence of cesarean section over the years.[1] Uterine rupture is a major obstetric hazard. It leads to high maternal and perinatal mortality-morbidity and loss of future fertility. Despite advances in modern obstetric practice, rupture of gravid uterus still remains as a fetal and maternal life threatening complication especially in developing countries; the incidence is high due to a greater number of unbooked obstetric emergencies, often originating from rural areas with poor antenatal care. In India it still accounts for 5-10% of all maternal deaths.[2] The perinatal mortality ranges from 80 to 95%.

Uterine rupture typically is classified as either: 1) Complete uterine rupture - when all layers of the uterine wall are separated, with or without expulsion of the fetus or 2) Incomplete uterine rupture-when the uterine muscle is separated but the visceral peritoneum is intact. Uterine rupture is also classified on the basis of previous surgery into 1) Rupture of scarred uterus 2) Rupture of unscarred uterus.

With the liberal use of primary cesarean section, scar rupture constitutes significantly to the overall incidence of uterine rupture. The incidence of LSCS scar rupture is about 1- 2%, while that following classical one is 5-10 times higher. Uterine scar, following hysterotomy behaves like that of a classical scar and is of growing concern.[3] Rupture of an unscarred uterus may be either traumatic or spontaneous. Traumatic factors include instrumental deliveries, internal podalic version, assisted breech delivery, abdominal trauma, labor induction, and in particular the unmonitored usage of oxytocin or prostaglandins. Fundal pressure during third stage of labor also has been linked to traumatic rupture. Spontaneous rupture is usually observed with cephalopelvic disproportion, delivery of a macrosomic or a grossly anomalous fetus, malpresentation. Rupture may also develop spontaneously in grand multiparas, congenitally abnormal uteri (e.g. Unicornuate or bicornuate), abnormal placental implantation, previous history of uterine perforation and in women with a history of invasive mole in previous pregnancy.[4, 5]

Maternal consequences are related to whether there is rupture of an intact uterus or a prior uterine scar. Scar separation following a trial of scar is associated with a lower risk of maternal death compared to

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spontaneous rupture of an unscarred uterus.[6] Fetal morbidity invariably occurs because of catastrophic hemorrhage leading to fetal anoxia. With rupture and expulsion of the fetus into the peritoneal cavity the chances of fetal survival are minimal. If the fetus is alive at the time of rupture, the only chance of continued survival is afforded by immediate diagnosis and delivery by laparatomy. Case fatality rate in rupture uterus may be reduced by early diagnosis, urgent resuscitation and laparatomy. Any form of delay increases the chances of dying from severe hemorrhage.[7]

Once a diagnosis of uterine rupture is established, immediate stabilization of the mother and the delivery of the fetus are imperative. After the fetus is delivered, the type of surgical treatment for the mother will depend on the type of uterine rupture, extent of uterine rupture, degree of haemorrhage, general condition of the mother and mother's desire for future childbearing.[8]

Other factors that may determine the type of surgical intervention includes urgency, patient's general condition as well as surgeons experience. Conservative surgical management involving uterine repair should be reserved for women who have low transverse uterine rupture, no extension of the tear to the broad ligament, cervix, or paracolpos, previous LSCS scar dehiscence, easily controllable uterine haemorrhage, good general condition, desire for future childbearing and no clinical or laboratory evidence of an evolving coagulopathy. Hysterectomy should be considered the treatment of choice when intractable uterine bleeding occurs or when the uterine rupture sites are multiple, longitudinal or low lying, bruised and contaminated.[9]

This obstetrics complication is also associated with short term maternal morbidities such as vesicovaginal fistula, rectovaginal fistula, bladder rupture, foot drop, psychological trauma, anemia and in the long term because of the surgical intervention, the woman may be sterilized which can lead to divorce and loss of economic support.[10]

II. Aims and Objectives

An early diagnosis, their timely referral from gross route level and prompt treatment of the condition is the most important factor in improving the maternal and perinatal outcome. This retrospective study was undertaken to evaluate the incidence of rupture uterus and analyse its various aspects.

III. Material and Methods

This was a retrospective observational study done in the department of obstetrics & gynaecology during September 2017 to August 2018. Data was collected from the registers of labour room, labour OT and medical records department of RIMS, Ranchi and entered in Microsoft excel 2007. Total cases of rupture uterus cases during the study period were included in the study. Cases of rupture /perforation of uterus due to MTP, Hydatiform mole, cornual pregnancy were excluded from the study. Incidence of rupture uterus per 1000 deliveries was calculated. Result of other parameters was obtained using percentage in each category.

IV. Observation and Result

Table 1 shows that the total number of deliveries during the study period was 6895 and the total number of rupture during the period was 70 giving an incidence of 10 per 1000 deliveries. This incidence is quite high because RIMS, Ranchi is a tertiary care and referral institute where maximum cases of rupture uterus are being referred from periphery.

Table 1: Showing Incidence of Rupture Uterus

Total no. of deliveries	No. of cases of rupture uterus	Incidence /1000	Incidence/ 100
6895	70	10 .1	1.01

Table 2 shows distribution of cases on the basis of age, area of residence and socioeconomic status. Majority of the patients (60%) were in the age group 20-30 years of age, followed by 30 -40 years age group (35.7%). Very few (1.4%) were less than 20 years of age and 2 (2.9%) more than 40 years keeping in view uterine exhaustion in primigravida patients and decreased fertility in patients 40 years of age. As a large population of Jharkhand still reside in villages, 65 patients (92.9%) were from rural areas and same number were from low socioeconomic status.

Table 2: Showing Distribution of Cases on the Basis of Sociodemographic Profile

Parameter	No. of Cases	Percentage
➢ Age Group		
<20	01	1.4%
20-30	42	60%
30-40	25	35.7%
>40	02	2.9%
➢ Area Of Residence		
Urban	05	7.1%
Rural	65	92.9%
➢ Socioeconomic Status		
Low	65	92.9%
Middle	05	7.1%

Table 3 shows distribution of cases on the basis of obstetric history, booking and referring status. 27 (38.57%) patients were para 2, 23 (32.85%) patients were ≥ para 4 , 19 (27.1%) were para3 and 1 was primipara. All 70 cases were unbooked, had rupture outside RIMS; 60 (85.7%) were referred case, whereas 10 (14.37%) had no referral paper .11 patients (15.7%) had gestational age < 36 weeks whereas 59 (84.3%) had rupture at ≥ 36 weeks gestational age.

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Table 3: Showing Distributon of Cases on the Basis of Obstetric History and Referring Status

Parameter	No. of Cases	Percentage
➢ Gravida		
P1	1	1.42%
P2	27	38.57%
P3	19	27.1%
≥P4	23	32.85%
➢ Booking Status		
Booked	00	0%
Unbooked	70	100%
➢ Referring Status		
Referred	60	85.7%
Non referred	10	14.3%
➢ Gestational Age		
< 36 weeks	11	15.7%
≥36 weeks	59	84.3%

Table 4 shows surgical history and findings. 47 (67.1%) had rupture of previous cs scar, others were non scarred uterus. Among the scarred uterus, only 4 (8.5%) had history of VBAC whereas 53 out of 70 had history of previous D & E (surgical method of MTP). 57 (81.4%) had rupture of lower uterine segment, whereas 13 (18.6%) had upper segment rupture. In none of the previous cesarian cases, we could get history of previous classical incision as majority were illiterate with no previous papers. 11 (15.7%) had undergone repair of the uterus without tubectomy, 20 (28.6%) had repair with tubectomy. 29 (41.4%) underwent subtotal hysterectomy and total hysterectomy was done in 10 (14.3%) patients .Decision of surgical management was guided by the number of living children, general condition of the patient, repairability of the uterus, adhesions, skill of the surgeon on duty, dissection of bladder from the lower uterine segment, availability of blood components and other comorbidities of the patient .

Table 4: Distribution of Cases on the Basis of Previous Surgical History, Intraoperative Finding and Type of Surgery Performed

Parameter	No. of cases	Percentage
➢ Previous Uterine Scar		
No	23	32.9%
Yes	47	67.1%
➢ H/O VBAC		
Yes	04	8.5%
No	43	91.5%
➢ H/O D& E		
Yes	17	24.3%
No	53	75.7%
➢ Site of Rupture		
Upper segment	13	18.6%
Lower segment	57	81.4%
➢ Type of Surgery Performed		
Repair without tubectomy	11	15.7%
Repair with tubectomy	20	28.6%
Subtotal hysterectomy	29	41.4%
Total hysterectomy	10	14.3%

Table 5 shows maternal and fetal mortality. There were 4 maternal mortality cases (5.7%) out of 70 cases of rupture uterus; the causes were acute renal failure, acute respiratory distress syndrome, sepsis and severe anemia leading to congestive cardiac failure. Fetal mortality was 68 (97%). Only two babies were delivered alive; in one case there was complete rupture of the LSCS scar but baby was lying still inside the uterine cavity, in the another one the baby was preterm, lying inside the peritoneal cavity outside the uterus, but was attached with the placenta which was still inside the uterus and the placenta was morbidly adherent placenta. The high maternal and fetal mortality was due to the fact that all cases were received at RIMS in a very bad condition, that too very late.

Table 5: Distribution of Cases on the Basis of Feto - Maternal Mortality

Parameter	No. of Cases	Percentage
➢ Maternal Mortality	04	5.7%
➢ Causes of Maternal Mortality		
Acute renal failure (ARF)	01	25%
Acute respiratory distress syndrome (ARDS)	01	25%
Sepsis	01	25%
Severe anemia leading to congestive cardiac failure	01	25%
➢ Fetal Mortality	68	97%

V. Discussion

Rupture uterus is a devastating complication with high maternal and perinatal morbidity-mortality rates. The incidence of rupture uterus varies widely from country to country and between different centres of the same country. In our study, the incidence of rupture uterus was 10 per 1000 deliveries (1.01%) whereas it was 0.64 % in the study by Kalewad P S[11], it was 0.763 % in the study by Beck R et al [12]. In developing countries like Nigeria it is higher i.e. 1.69% according to study conducted by Ibrahim S M, Umar N I et al. [13] The incidence in developed countries is at least ten times lower i.e. 0.086% in Australia study conducted by Lynch J C, Pardy J P et al.[14]

In our study, majority of the patients (60%) were in the age group 20-30 years of age, followed by 30 -40 years age group (35.7%). In the study by Kalewad P S, 60% of the cases were in the 26-30 year age group whereas 27% were in the 21-25 years age group[11]. Similarly, Beck et al observed majority of the patients

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(42.5%) in the age group 21 to 25 years followed by 26-30 years age group.[12] Shastrakar reported maximum incidence of rupture uterus in age group 16-20 years followed by age group 21-35 year.[15] Khattak Z et al found majority of the patient were of age group 31-40 year followed by 21-30 years.[16] Latika S et al found maximum number of rupture uterus between age group 21-30 years.[17] Omole-Ohonsi A et al also found most of the rupture occurred between 21-30 years.[18] Study conducted in Nigeria by Ibrahim S M, Umar N I et al uterine rupture was seen most commonly in 25-35 years of age group.[13]

At our centre, majority cases of rupture uterus were from rural areas (92.9%) with low socioeconomic status (92.9%). In the similar study at the same centre by Beck R et al [12], majority of the patients (92.5%) were from rural background .In the study by Kalewad P S, 90 % of the patients belonged to the low socioeconomic status.[11] Illiteracy, poor transport, no antenatal check up, social customs and prior successful home deliveries prevent these pregnant women from seeking medical advice. They come to hospital only when some unavoidable complications has taken place and that too very late.

In the present study, 27 (38.57%) patients were para 2, 23 (32.85%) patients were ≥ 4th para, 1 was primipara and none were primigravida .In the study by Beck R et al, majority of the patients were para 2 and 3 (63.75%) and 3 cases (3.75%) of rupture was seen in primigravida.[12] In the study by Kalewad P, 51% cases were para 2, 14.5% were ≥ para 3, 33% were para 1 and 1 was primigravida.[11]

All 70 cases were unbooked, had rupture outside RIMS; 60 (85.7%) were referred case, whereas 10 (14.37%) had no referral paper. Beck et al observed 97.5 % of the cases to be unbooked whereas in the study by Kalewad PS et al, 45 (65.3%) cases were unbooked and 24 (34.7%) were booked cases.[12,11]

In the present study, 11 patients (15.7%) had gestational age < 36 weeks whereas 59 (84.3%) had rupture at ≥36 weeks gestational age. Beck et al observed 93.75% cases at gestational age 35 weeks and above. [12]

47 (67.1%) had rupture of previous of previous cs scar ,the incidence being 0.97% which was very high as compared to the study by Preety Aggarwal (0.057%)[19]. 66% cases were previous cesarean in the study by Kalewad P S, 45.33% cases had scar rupture in the study by Beck et al and study conducted in Rawalpindi medical college by Ara J et al, 86.7% were scarred uterus[11,12,,20]

57 (81.4%) had rupture of lower uterine segment. In the study by Sinha M, rupture of prior low transverse cesarean section was 84.8%.[21] in the study by Beck et al, it was 94.12%, in the study by Aggarwal P, it was 30.8%, in the study by Kalewad P and in the study by Ibha K, Poonam G, Sehgal A , it was 49.1%.[12,19,11,22]

The decision to perform uterine repair or hysterectomy in cases of rupture uterus is influenced by factors like parity, number of living children, extent of uterine repair, condition of the tissues and the general condition of the patient. In the present study 11 (15.7%) had undergone repair of the uterus without tubectomy, 20 (28.6%) had repair with tubectomy. 29 (41.4%) underwent subtotal hysterectomy and total hysterectomy was done in 10 (14.3%) patients. In the study by Beck et al, repair of the uterus without tubectomy was done in 15% cases, repair with bilateral tubectomy in 25 (31.25%) cases, hysterectomy in 53.75% cases.[12] Habiba U et al reported that hysterectomy either total or subtotal was performed in 70% of their cases of rupture uterus.[23] Total hysterectomy was performed in 5.85 cases, subtotal hysterectomy in 15.2% cases and primary repair with sterilization in 67% of cases.[11]

There were 4 (5.71 %) maternal mortality cases out of 70 cases of rupture uterus; the causes were acute renal failure, acute respiratory distress syndrome, sepsis and severe anemia leading to congestive cardiac failure. Maternal death was 2.9% in the study by Kalewad P, 3.75% In Beck et al, 30.8% in Aggarwal P et al, 0% in Sinha M et al, 2.5% in the study by Singh A et al, 1.1% in the study by Ibrahim S M.[11,12,19,21,24,13]

Fetal mortality was 97%. Only two babies were delivered alive; in one case there was complete rupture of the LSCS scar but baby was lying still inside the uterine cavity, in the another one the baby was lying inside the peritoneal cavity outside the uterus, but was attached with the placenta which was still inside the uterus and the placenta was morbidly adherent placenta. In the study by Sinha M, there were 32 cases of intrauterine fetal demise, 5 cases of stillbirths, 8 babies with low apgar scores and 3 of them died in neonatal ICU.[21] Perinatal mortality was 97.5% in the study by Beck et al, 53.8% in Aggarwal P et al and 87.4% in a study in Nigeria.[12,19,13] In the study by Kalewad P, the perinatal mortality was only 10.1%.

VI. Conclusion

As a large population of Jharkhand reside in remote rural areas with low socioeconomic status and illiteracy, still a large population misses good antenatal checkup and proper delivery facility resulting in rupture uterus. The incidence of rupture uterus in a teaching and referral hospitals is high due to a large proportion of them being referred cases and increasing incidence of VBAC .Rupture uterus is an important cause of maternal and fetal morbidity - mortality. Incidence of rupture uterus can be reduced through effective and quality antenatal checkup, institutional VBAC, delivery by skilled healthcare providers and timely referral of cases like cephalopelvic disproportion, obstructed labour prolonged labour and malpresentation.

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