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Corresponding Author
M. Chaithra,
Department of Obstetrics and Gynaecology, Jagadguru Jayadeva Murugarajendra Medical College (JJMMC), Davangere, Karnataka, India

Author Designation
[1]Assistant Professor
[2]Associate Professor
[3]Post Graduate
[4]Scientist B

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Rupture Uterus in a Tertiary Care Teaching Hospital: A Retrospective Study

[1]M. Chaithra, [2]K.S. Govindaswamy, [3]G. Vyshnavi and [4]B. Manjula

[1,3]Department of Obstetrics and Gynaecology, Jagadguru Jayadeva Murugarajendra Medical College (JJMMC), Davangere, Karnataka, India
[2]Department of Biochemistry, Shimoga Institute of Medical Sciences, Shivamogga, Karnataka, India
[4]Multidisciplinary Research Unit, Shimoga Institute of Medical Sciences, Shivamogga, Karnataka, India

ABSTRACT
Uterine rupture constitutes a critical obstetric complication that is concomitant with elevated levels of maternal and fetal morbidity and mortality, particularly within tertiary care facilities. The incidence of this condition exhibits variability, with empirical studies documenting rates ranging from 0.034-0.43% across diverse Indian healthcare institution centers. Prominent risk factors are identified as prior cesarean deliveries and obstructed labor, whereby the prompt recognition and intervention are paramount for enhancing clinical outcomes. The present study is a retrospective study executed within the Department of Obstetrics and Gynecology at our tertiary healthcare center. Data spanning one year were meticulously gathered from the obstetrics and gynecology record book and the medical records department. All instances of both complete and incomplete uterine rupture were systematically included in this study. Throughout the one-year duration of the study, specifically from March 2022 to February 2023, among a total of 7200 deliveries, uterine rupture was diagnosed in 18 cases, yielding an incidence rate of 0.25%. Uterine rupture signifies a substantial complication affiliated with pregnancy, resulting in considerable maternal and perinatal morbidity and mortality. The outcomes of this investigation suggest that the presence of a prior cesarean scar represents the most significant risk factor contributing to the incidence of uterine rupture.

INTRODUCTION

A uterine rupture is characterized by a complete separation of all three layers of the uterus: The endometrium (the innermost epithelial layer), myometrium (the middle smooth muscle layer) and perimetrium (the outer serosal surface). This condition is a severe obstetric complication marked by a full-thickness disruption of the uterine wall, frequently culminating in notable maternal and fetal morbidity and mortality. The global incidence of uterine rupture is heterogeneous, displaying elevated rates within developing nations. In the context of India, the reported incidence of uterine rupture varies, with studies indicating rates from 0.74-1.71% among the pregnant population[1,2]. In the most recent national maternal mortality statistical data, uterine rupture was responsible for of deaths associated with hemorrhage[3]. It may be classified as either primary or secondary. The overall prevalence is estimated at 3 per 10,000 births[4]. Among women without a history of cesarean delivery, the prevalence is observed to be 0.6 per 10,000 births, in contrast to a prevalence of 22 per 10,000 among those with a previous cesarean delivery [4]. This condition is deemed preventable and timely diagnosis along with prompt intervention could yield improved clinical outcomes. Significant predisposing factors encompass unbooked status (70.3% of cases), inadequate antenatal care and abbreviated inter -pregnancy intervals[5]. Obstructed labor is frequently acknowledged as a primary contributing factor, in conjunction with previous surgical interventions on the uterus[5]. While uterine ruptures predominantly occur in pregnant women, instances have also been documented in non-pregnant women subjected to trauma, infection, or malignancy involving the uterus[6]. The incidence of maternal morbidity is significantly elevated, with blood transfusions required in up to 94.5% of cases[5]. Perinatal mortality rates may ascend to 91.3%, highlighting the profound ramifications associated with uterine rupture[1]. The sequelae of uterine rupture are contingent upon the duration that transpires between the identification of the rupture and the caliber of medical intervention administered. This obstetric emergency can lead to dire ramifications for both the mother and the fetus if not addressed promptly. Notwithstanding the strides made in healthcare, uterine rupture persists as a preventable yet significant concern within India, highlighting the urgent need for enhanced access to prenatal healthcare and competent delivery services. Given the rising incidence of uterine rupture, the current investigation aims to assess the prevalence of this condition within our tertiary healthcare institution.

MATERIALS AND METHODS

This study is of a retrospective nature and was executed within the Department of Obstetrics and Gynaecology at our tertiary healthcare centre. The timeframe of the study spanned one year, from March 2022 to February 2023. Ethical clearance was obtained from the Institutional ethical review committee. The study encompassed all cases of both complete and incomplete uterine rupture. A structured proforma was devised to document all pertinent demographic information and clinical parameters. A comprehensive list of uterine rupture cases was extracted from the departmental obstetrics registry prior to the retrieval of the relevant case note files. Case files indicating a diagnosis of uterine rupture were sourced from the records department and data pertaining to maternal demographic characteristics, risk factors, induction or augmentation of labor, medical or surgical interventions, instrumentation, intrauterine manipulation, as well as maternal and perinatal outcomes were meticulously recorded utilizing the proforma. All pertinent data was subsequently entered into a Microsoft Excel spreadsheet, with statistical analyses conducted using Statistical Package for the Social Sciences software.

RESULTS and DISCUSSIONS

Throughout the one-year study period, a total of 7200 deliveries were conducted, among which 18 cases of ruptured uterus were documented. The incidence of uterine rupture was determined to be 0.25% within our tertiary healthcare center. Of the 18 cases of uterine rupture, 14 (77.7%) were referrals, while 4 (22.2%) were booked cases at the hospital.

Table 1: Demographic and Clinical Findings of the Cases

Demographic and clinical findings	Frequency	Percent
Age in years		
<25	3	16.7
25-30	9	50
31-35	5	27.8
36-40	1	5.5
Parity		
Primi	1	5.5
Multi	16	89
Grand multi	1	5.5
Period of gestation in weeks		
28- 34	3	16.7
33-36	2	11.1
37-40	13	72.2
Risk factors		
Lower segment caesarean section	11	61.2
Obstructed labour	3	16.8
Twin pregnancy	1	5.5
Instrumental delivery	1	5.5
Prolonged Preterm premature rupture of membrane	1	5.5
Previous dilation and curettage	1	5.5

The average age of cases with ruptured uterus was calculated to be 28.8±4.8 years, with the majority falling within the 25-35 years age group. A predominance of cases was noted among multiparous

women (88.8%). The gestational age of the patients varied from 28 weeks to 40 weeks, with uterine rupture predominantly observed in term pregnancies, occurring between 37-40 weeks gestation in 72.2% of cases and in 27.7% of preterm cases. The principal etiological factor identified for uterine rupture in this study was a prior caesarean section scar, followed by obstructed labor, accounting for 61.1% and 16.6% of cases, respectively (Table 1).

Table 2: Type, Site of Rupture and Management Data of the Cases

Type of rupture and management	Frequency	Percent
Complete	15	83.3
Incomplete	3	16.7
Site of rupture		
Upper segment posterior wall	3	16.7
Upper segment lateral wall	1	5.5
Lower segment anterior wall	12	66.8
Lower segment lateral wall	1	5.5
Left uterine cornual rupture	1	5.5
Surgical management undertaken		
Surgical repair with sterilization	9	50
Surgical repair without sterilisation	7	38.9
Peripartum hysterectomy	2	11.1

Complete uterine rupture was recorded in 83.3% of the cases, with the lower uterine segment anterior wall identified as the most prevalent site. All cases of uterine rupture transpired during the intrapartum period, with the exception of one case occurring antepartum. Management strategies were stratified based on the nature of the rupture, parity status and the clinical condition of the patient. The most frequently performed surgical intervention was uterine repair accompanied by tubal ligation, executed in 50% of cases, followed by surgical repair without sterilization in 38.9% of cases. Peripartum hysterectomy was carried out in 11.1% of cases (Table 2).

Table 3: Complications

Complications	Frequency	Percent
No complications	9	50
Blood transfusion	7	39
Sepsis	1	5.5
ICU admission	1	5.5
Perinatal status		
Live birth	11	61.1
Still birth	7	38.9

A ranges of maternal complications subsequent to uterine rupture were observed. Post-operatively, 39% of patients exhibited anemia necessitating blood transfusions and extended hospitalization., among these, 1 case demonstrated indications of sepsis, warranting admission to the intensive care unit. Conversely, the remaining 50% of cases did not present any complications. Notably, there were no maternal fatalities attributed to uterine rupture during the study's duration. Perinatal mortality was recorded in 7 (38.9%) of the 18 cases of uterine rupture, all of which resulted in stillbirths (Table 3).

The rupture of a gravid uterus precipitates significant complications that jeopardize the well-being of both the mother and the neonate. Despite its relatively low incidence, it is regarded as one of the most critical obstetric emergencies. If not identified promptly, it can lead to severe fetal and maternal outcomes, even in settings equipped with advanced medical resources. In our study, out of 7200 deliveries 18 cases of ruptured uterus were noted, with a 0.25% incidence within a tertiary healthcare center. The majority were multiparous women, with a majority of cases occurring in term pregnancies. The primary etiological factors were a prior caesarean section scar and obstructed labor. The most common surgical intervention was uterine repair accompanied by tubal ligation, followed by surgical repair without sterilization in 38.9% of cases. Post-operatively, 39% of patients experienced anemia, blood transfusions and extended hospitalization. No maternal fatalities were attributed to uterine rupture, but perinatal mortality was recorded in 7 cases, all resulting in stillbirths. The incidence of uterine rupture in our investigation was 0.25%, which surpasses the 0.127% reported in a study conducted at a tertiary center in King George Hospital in Vishakhapatnam by Bhavani[7]. Another study from Eastern Nepal reported a prevalence of 0.45%[8]. The heightened prevalence of rupture in our study may be attributed to a significant number of referred cases. A considerable proportion of high-risk cases for rupture, such as those with a history of cesarean section or grand-multiparous status, are subjected to trials of labor, often resulting in delayed referrals. A cross-sectional study conducted in a tertiary care facility in Ethiopia documented a prevalence of 0.9%, indicating even more dire conditions than those observed in our setting[9]. The majority of uterine rupture cases in our study were found within the age bracket of 25-30 years, yielding a mean age of 28.83±4.82 years. This is closely aligned with findings from a corresponding study by Dawud *et al*., which reported a mean age of 29.38 years[9]. The average parity was determined to be 2, with a significant proportion of women in this study classified as multiparous (88.8%). This finding bears resemblance to the research conducted by Chudal et al., which identified a mean parity of 2 and noted that the majority of their uterine rupture cases were also multiparous (91.6%). The age and parity distribution in our study were found to be consistent with observations made in other research endeavors[10]. Out of the 18 documented instances of uterine rupture, a substantial proportion of the cases within our investigation, specifically 14 (77.7%), were identified as referrals. This finding aligns with a significant number of other studies that indicate a heightened prevalence of referred cases, as illustrated in the research conducted by Chudal *et al.,* where 83.3% of the cases were classified as unbooked[10]. The

classification of the patient as unbooked[10] was identified as a prominent risk factor for uterine rupture in the analysis performed by Iqbal *et al*., potentially attributable to delays in hospital referral, which in turn may lead to increased perinatal mortality and maternal complications[11]. In our analysis, uterine rupture predominantly occurred in term pregnancies, specifically within the gestational age bracket of 37 to 40 weeks, accounting for 72.2% of cases. This observation is consistent with results from another study conducted by Chudal *et al.,* where 91.6% of their recorded uterine rupture cases fell within the same gestational age cohort[10]. The most prevalent risk factor identified in our study was the rupture of a previous caesarean scar, followed closely by obstructed labor, with occurrences of 61.1% and 16.6% respectively. This finding corroborates similar investigations conducted by Chudal *et al.,* wherein caesarean scar rupture was cited as the causative factor in 58.3% of their uterine rupture cases[10]. Furthermore, Sunanda N *et al.* also concluded that the separation of a prior caesarean section scar was the predominant cause of rupture in their two-year examination of uterine rupture during pregnancy in Mysore, India[12]. With the ongoing increase in the trend of caesarean sections within private healthcare facilities in India, the incidence of patients presenting to the labor ward with a history of scarred uteri post-onset of labor is escalating, thereby heightening their risk for uterine rupture. This phenomenon may elucidate the high incidence of complete ruptures observed in our study (83.3%), which is comparable to the findings reported by Chudal *et al.*, who noted that 66.67% of uterine rupture cases were classified as complete[10].

Timely surgical intervention is frequently deemed crucial for the effective management of uterine rupture. The therapeutic approach typically involves surgical repair of the uterine rupture, with or without sterilization, contingent upon family planning considerations and patient consent. Total or subtotal hysterectomy may also be contemplated in instances of severe uterine hemorrhage. The repair of the rupture is feasible and aids in the preservation of the reproductive capacity of patients, with the risk of recurrent uterine rupture assessed to range between 4.8% and 19% in subsequent pregnancies[13]. Consequently, in our investigation, uterine repair accompanied by tubal ligation was performed in 9 (50%) cases, followed by surgical repair without sterilization in 7 (38.8%) cases. Peripatus hysterectomy was executed in 2 (11.1%) cases. This is consistent with the findings of Chudal *et al.,* where a majority of uterine rupture cases (66.67%) underwent uterine repair[10]. The predominant proportion of cases (55.5%) in our investigation did not experience any subsequent life-threatening complications, while a mere 44.4% of the uterine rupture instances necessitated a blood transfusion. Only a singular case within the cohort exhibited manifestations of sepsis. This observation indicates a more favorable trend compared to a related study conducted by Chudal *et al.,* which reported that 58.3% of uterine rupture cases required admission to the intensive care unit due to life-threatening complications[10]. Notwithstanding the significant maternal complications linked to uterine rupture, our analysis revealed no maternal fatalities, with 11 (61.2%) cases resulting in live births. In contrast, a systematic review by the World Health Organization conducted in 2005 indicated a maternal mortality rate ranging from 1-13%, alongside a perinatal mortality rate between 74% and 92% following uterine rupture[14]. This investigation is subject to certain limitations, notably its retrospective design, which may introduce selection bias. Furthermore, it is deficient in data pertaining to the subsequent follow-up of patients to monitor for late complications. However, a notable strength of this study lies in the extensive cohort of cases, despite its classification as a single-center study.

CONCLUSION

Uterine rupture constitutes a critical complication associated with pregnancy, contributing to both maternal and perinatal morbidity and mortality. This investigation elucidates that a prior cesarean scar represents the most prevalent risk factor for uterine rupture. The prompt identification and management of uterine rupture in these circumstances substantially mitigate maternal and perinatal morbidity and mortality. It is imperative to promote the involvement of skilled birth attendants and the prudent administration of oxytocin and misoprostol in pregnant women during labor. Additionally, encouraging regular antenatal care checkups and institutional deliveries is essential for minimizing the incidence of uterine rupture.

REFERENCES

1. Singh, M., P. Sachan, M.L. Patel and R. Sachan, 2019. Foeto-maternal Outcome in Scarred and Unscarred Rupture Uterus of North Indian Population. Int. J. Med. Public Health, 9: 46-49.
2. Abrar, S., T. Abrar, E. Sayyed and S.A. Naqvi, 2022. Ruptured uterus: Frequency, risk factors and feto-maternal outcome: Current scenario in a low-resource setup. PLOS ONE, Vol. 17 .10.1371/journal.pone.0266062.
3. Desta, M., G.M. Kassa, T. Getaneh, Y. Sharew and A.A. Alemu *et al.,* 2021. Maternal and perinatal mortality and morbidity of uterine rupture and its association with prolonged duration of operation

in Ethiopia: A systematic review and meta-analysis. PLOS ONE, Vol. 16 .10.1371/journal.pone.0245977.

4. Vandenberghe, G., K. Bloemenkamp, S. Berlage, L. Colmorn and C. Deneux-Tharaux, *et al.,* 2019. The International Network of Obstetric Survey Systems study of uterine rupture: A descriptive multi-country population-based study. BJOG., 126: 370-381.
5. Paprikar, S., A. Lagoo and J. Lagoo, 2022. Uterine rupture: Review of cases from tertiary care centre in India. Int. J. Reprod., Contraception, Obstet. Gynecol., 11: 2499-2504.
6. Togioka, B.M. and T. Tonismae., 2023. Uterine rupture. In: StatPearls [Internet]. 0.
7. Paidi, S., B.K. and P.P. S, 2022. Unscarred uterine rupture: A retrospective analysis. Int. J. Reprod., Contraception, Obstet. Gynecol., 11: 1269-1271.
8. Gerard, G., M. Nahum and FACS., 2021. Uterine rupture in pregnancy [Internet]. 0.
9. Ahmed, D.M., T.S. Mengistu and A.G. Endalamaw, 2018. Incidence and factors associated with outcomes of uterine rupture among women delivered at Felegehiwot referral hospital, Bahir Dar, Ethiopia: Cross sectional study. BMC Pregnancy Childbirth, Vol. 18 .10.1186/s12884-018-2083-8.
10. Chudal, D., S. Shrestha, R. Shrestha and V. Paudel, 2021. Rupture Uterus in a Tertiary Care Centre: A Descriptive Cross-sectional Study. J. Nepal Med. Assoc., 59: 392-395.
11. Al-Zirqi, I., A.K. Daltveit, L. Forsén, B. Stray-Pedersen and S. Vangen, 2017. Risk factors for complete uterine rupture. Am. J. Obstet. Gynecol., 216: 165.e1-165.e8.
12. S.N. and P. Ranganth, 2016. A two-year analysis of uterine rupture in pregnancy. Int. J. Reprod., Contraception, Obstet. Gynecol., 5: 3983-3986.
13. Colmorn, L.B., K.B. Petersen, M. Jakobsson, P.G. Lindqvist and K. Klungsoyr *et al.*, 2015. The Nordic Obstetric Surveillance Study: A study of complete uterine rupture, abnormally invasive placenta, peripartum hysterectomy and severe blood loss at delivery. Acta Obstetricia Gynecologica Scand., 94: 734-744.
14. Hofmeyr, G.J., L. Say and A.M. Gülmezoglu, 2005. Systematic Review: WHO systematic review of maternal mortality and morbidity: The prevalence of uterine rupture. BJOG: An Int. J. Obstet. And Gynaecology, 112: 1221-1228.