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A Prospective Observational Study on Cases of Ruptured Uterus in a Tertiary Care Centre

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Abstract
Background: To study the maternal and fetal outcomes in cases of ruptured uterus. **Material and Methods:** It is a prospective study conducted in a tertiary care hospital for a period of 1 year from January 2020 to December 2020. **Results:** Out of 8860 births at our institute, 38 had ruptured uterus. Mean age at presentation was 25.71 with 3.7 SD. Most instances were unbooked, low-income, and rural. Only 34.2% of cases were referred; the remainder were diagnosed and handled in-house. 70% of cases were parity 2 and 3, and many were prior caesareans. 68.4% of cases had abdominal pain. 71.1% of patients were handled by Emergency LSCS with rent repair as most were incomplete uterine ruptures. Lower anterior section ruptures were most prevalent. Complete ruptures needed most blood infusions. In this study, 47.4% of perinatal deaths are attributed to ruptures. Study found 2.6% maternal mortality. **Conclusion:** Rupture uterus most commonly occurred in scarred uterus. Identification of high risk pregnancy, judicious caesarean section, proper labor monitoring, early diagnosis and prompt management are essential in reducing its occurrences.
Keywords: Caesarean section, maternal mortality, perinatal mortality, rupture uterus.

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Introduction

Rupture uterus is a severe pregnancy and labour condition that requires obstetric emergency care. Ignorance, poverty, and rural illiteracy make ruptured uterus a common maternal problem in India.

Failure to treat this issue can lead to stillbirths, maternal illness, and even death. Scarred uterus ruptures more often than unscarred. Every modern industrialized countries, normal, unscarred uteri rupture 1 in 8434 pregnancies (0.012%). 1. A retrospective 7-year research in a tertiary hospital in India showed 1 in 1633 scar ruptures (0.061%) 2. The prevalence has remained steady.

Due to enhanced obstetric services in complex obstructed labour and institutional births, the rupture rate has decreased, although there is an increased incidence of uterine rupture in previous caesarean section cases. High clinical suspicion, early diagnosis, fast referral, and timely care of uterine rupture improve maternal and perinatal outcomes. Identifying high-risk pregnancies for uterine rupture at antenatal booking, guided following, supporting institutional births, and timely referral from grassroots level help prevent this. Transportation from peripheral health centres is also important.

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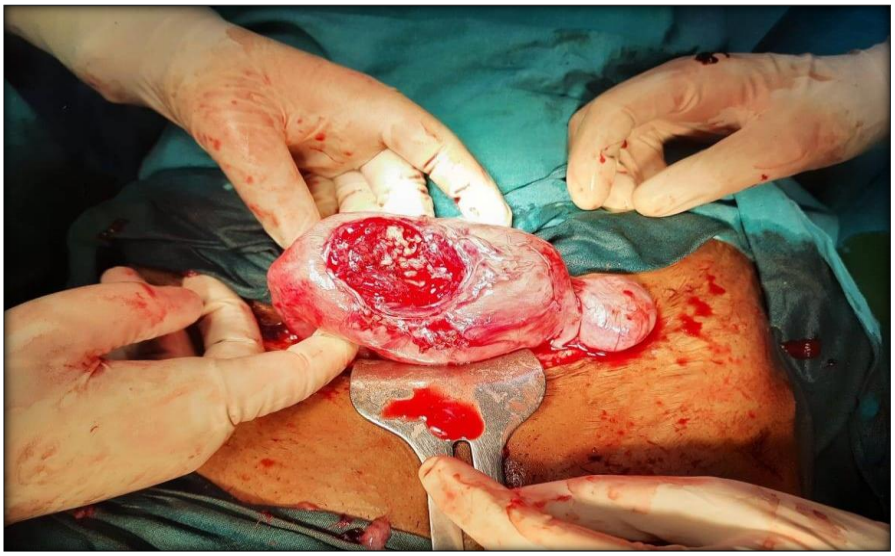

Figure 1: Intraoperative picture showing 3x2 cm rent on the fundus of the uterus

AIMS AND OBJECTIVES

- To analyse the risk factors in cases of ruptured uterus
- To study the clinical presentation of cases of ruptured uterus
- To study clinical management of cases of ruptured uterus
- To study the maternal and fetal outcomes in cases of ruptured uterus

Material and Methods

Patients and Methods

It is a prospective study conducted in a tertiary care hospital for a period of 1 year from January 2020 to December 2020.

Inclusion criteria:

- All cases of scarred/unscarred with signs and symptoms of rupture uterus
- Asymptomatic rupture detected on table during caesarean section

Exclusion criteria:

- No signs and symptoms of ruptured uterus

Methodology:

Hospital ethics authorized the study. Pregnant women consented. Demographics, method of presentation, prior and present obstetric history, and general exam were documented. Details about surgical care, rupture type and place, and blood transfusions were noted and monitored until discharge for mother and foetal outcome. SPSS version 21 was used to analyse Excel data. Continuous data were given as mean SD and categorical data as percentages. Study used Chi square. Less than 0.05 was considered statistically significant.

Results

Out of the total 8860 Deliveries conducted in our hospital over a period of one year i.e from January 2020 to December 2020, 38 cases were ruptured uterus. So the incidence in our study was 0.43%. These cases were analysed with respect to risk factors, clinical presentation, mode of management, maternal and fetal outcomes.

Table 1: Incidence of rupture uterus:

Total number of deliveries	Number of rupture uterus cases	Incidence
8860	38	0.43%

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Table 2: Age wise distribution in study group:

Age	Number	Percentage (%)
20 – 25 years	20	52.6
26 – 30 years	14	36.8
31- 35 years	4	10.5
Total	38	100
Mean = 25.71 years, S.D = 3.705		

In the present study, 52.6% of the subjects were in the age group of 20 to 25 years followed by 36.8% in the age group of 26 – 30 years and 10.5% of the subjects were in the age group of 31 to 35 years. The mean age was 25.71 years with a standard deviation of 3.7 years.

Table 3: Distribution of Age among scarred vs unscarred uterus in study group:

	Scarred uterus		Unscarred uterus		
Age	Number	Percentage (%)	Number	Percentage (%)	Total
20 – 25 years	17	53.1	3	50	20 (52.6%)
26 – 30 years	12	37.5	2	33.3	14 (36.8%)
31 – 35 years	3	9.4	1	16.7	4 (10.5%)
Total	32	100	6	100	38 (100%)
Chi-square = 0.288, p = 0.866					

In the present study, 53.1% and 50% of the cases with scarred and unscarred uterus respectively were in the age group of 20 – 25 years. 37.5% and 33.3% of the cases with scarred and unscarred uterus respectively were in the age group of 26 – 30 years. 9.4% and 16.7% of the cases with scarred and unscarred uterus respectively were in the age group of 31 – 35 years.

Table 4: Distribution of booking status in study group:

Booking status	Number	Percentage (%)
Booked	4	10.5
Un-booked	34	89.5
Total	38	100

In the present study, 10.5% of the cases were booked and 89.5% of the cases were un-booked cases.

Table 5: Area wise distribution of patients in study group:

Area of residence	Number	Percentage (%)
Rural	27	71.1
Urban	11	28.9
Total	38	100

In the present study, 71.1% of the subjects belonged to rural areas and 28.9% of the subjects belonged to urban areas.

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Table 6: Distribution of Socio-economic status of patients in study group:

Socio-economic status	Number	Percentage (%)
Lower	38	100
Total	38	100

In the present study, 100% of the subjects belong to lower socio-economic status.

Table 7: Number of patients referred in study group:

Referred case	Number	Percentage (%)
Yes	13	34.2
No	25	65.8
Total	38	100

In the present study, 34.2% of the cases were referred from other centres.

Table 8: Parity wise distribution of patients in study group:

Parity	Number	Percentage (%)
1	4	10.5
2 - 3	29	76.3
4 - 5	4	10.5
6	1	2.6
Total	38	100

In the present study, 76.3% of the subjects were parity 2 and 3 followed by 10.5% in parity 1, 10.5% in parity 4 and 5, 2.6% of the subjects were with the parity 6 respectively.

Table 9: Distribution of parity in scarred vs unscarred uterus in study group:

Parity	Scarred uterus		Unscarred uterus		Total
	Number	Percentage (%)	Number	Percentage (%)	
Primi	0	0	4	66.7	34 (89.5%)
Multi	32	100	2	33.3	4 (10.5%)
Total	32	100	6	100	38 (100%)
Chi-square = 23.84, p = 0.000					

In the present study, 100% of the cases who had scarred uterus were Multiparity. Among the cases with unscarred uterus, 66.7% and 33.3% of the cases were primi and multi parity respectively and the difference was found to be statistically significant.

Table 10: Distribution of Gestational age in scarred vs unscarred uterus in study group:

Gestational age	Scarred uterus		Unscarred uterus		Total
	Number	Percentage (%)	Number	Percentage (%)	
<37 weeks	11	34.4	1	16.7	12 (31.6%)
≥37 weeks	21	65.6	5	83.3	26 (68.4%)
Total	32	100	6	100	38 (100%)
Chi-square = 0.733, p = 0.392					

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In the present study, 34.4% and 16.7% of the cases who had scarred and unscarred uterus respectively had gestational age of <37 weeks. 65.6% and 83.3% of the cases who had scarred and unscarred uterus respectively had gestational age of ≥37 weeks.

Table 11: Distribution of study subjects by Inter Delivery Interval:

Inter delivery Interval	Number	Percentage (%)
<1 year	1	2.94
1 to 1.5 years	8	23.53
2 to 2.5 years	13	38.24
3 to 3.5 years	8	23.53
4 years	3	8.82
5 years	1	2.94
Total	34	100

In the present study, the inter delivery interval was 2 to 2.5 years in 38.24% of the cases, followed by 1 to 1.5 years, 3 to 3.5 years, 4 years, <1 year and 5 years in 23.53%, 23.53%, 8.82%, 2.94% and 2.94% of the cases respectively.

Table 12: Mode of symptomatic presentation in study group:

Mode of presentation	Number	Percentage (%)
Pain abdomen	26	68.4
Bleeding P/V	4	10.5
Obstructed labour	2	5.3
Cord prolapse	1	2.6
Pain at scar site	2	5.3
Shock	1	2.6
Vomiting	2	5.3
Total	38	100

In the present study, pain abdomen was the most common clinical feature in 68.4% of the cases followed by bleeding P/V in 10.5%, obstructed labour and pain at scar site in 5.3% each, shock and cord prolapse in 2.6%, vomiting in 5.3% respectively.

Table 13: Distribution of site of rupture in study group:

Site of Rupture	Number	Percentage (%)
Lower segment Anterior wall	34	89.5
Lateral wall	3	7.9
Fundus	1	2.6
Total	38	100

In the present study, the site of rupture was Lower segment anterior wall in 89.5% of the subjects followed by later wall of uterus in 7.9% and fundus in 2.6% of subjects.

Table 14: Distribution of type of rupture in study group:

Type of rupture	Number	Percentage (%)
Complete	18	47.4
Incomplete	20	52.6
Total	38	100

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In the present study, the type of rupture was complete in 47.7% of the subjects and incomplete in 52.6% of the subjects.

Table 15: Distribution of Type of rupture in scarred vs unscarred uterus in study group:

Type of rupture	**Scarred uterus**		**Unscarred uterus**		
	Number	Percentage (%)	Number	Percentage (%)	**Total**
Complete	12	37.5	6	100	18 (47.4%)
Incomplete	20	62.5	0	0	20 (52.6%)
Total	32	100	6	100	38 (100%)
Chi-square = 7.917, p = 0.005					

In the present study, the type of rupture in cases with scarred uterus was complete in 37.5% of the cases and incomplete in 62.5% of the cases. The type of rupture in cases with unscarred uterus was complete in 100% of the cases and the difference was found to be statistically significant.

Table 16: Distribution of etiology of uterine rupture in study group:

Cause of Rupture	**Number**	**Percentage (%)**
Prior section in labour	32	84.2
Obstructed labour	4	10.5
Anomalous uterus	2	5.3
Total	38	100

In the present study, the cause of rupture was Prior section in labour in 84.2% of the cases followed by obstructed labour in 10.5% of cases and anomalous uterus in 5.3% of the cases.

Table 17: Distribution of etiology of rupture in scarred vs unscarred uterus in study group:

Cause of rupture	**Scarred uterus**		**Unscarred uterus**		Total
	Number	Percentage (%)	Number	Percentage (%)	
Prior section in labour	32	100	0	0	32 (84.2%)
Obstructed labour	0	0	4	66.7	4 (10.5%)
Anomalous uterus	0	0	2	33.3	1 (5.3%)
Total	32	100	6	100	38 (100%)
Chi-square = 38.0, p = 0.000					

In the present study, the cause of rupture in cases with scarred uterus was prior section in labour in 100% of the cases. The cause of rupture in cases with unscarred uterus was obstructed labour in 66.7% and anomalous uterus in 33.3% of the cases and the difference was found to be statistically significant.

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Table 18: Distribution of mode of surgical management in study group:

Surgical management	Number	Percentage (%)
Emergency LSCS with Rent repair	21	55.3
Emergency Laparotomy with rent repair	16	42.1
Emergency Laparotomy with caesarean hysterectomy with right ureteric reimplantation with bladder repair	1	2.6
Total	38	100

In the present study, the surgical management in 55.3% of the cases was Emergency LSCS with Rent repair followed by Emergency Laparotomy with rent repair in 42.1% of the cases and Emergency Laparotomy with caesarean hysterectomy with right ureteric reimplantation with bladder repair in 2.6% of the cases.

Table 19: Distribution of maternal outcome in study group:

Maternal mortality	Number	Percentage (%)
Yes	1	2.6
No	37	97.4
Total	38	100

In the present study, the maternal mortality in the subjects was 2.6%.

Table 20: Distribution of neonatal APGAR score in study group:

APGAR score	Number	Percentage (%)
0	18	47.4
2 – 4	1	2.6
4 – 6	1	2.6
8 - 10	18	47.4
Total	38	100

In the present study, the APGAR score of the new borns was 0 in 47.4% of the cases followed by 8 to 10 in 47.4% of the subjects, 2 – 4 and 4 – 6 in 2.6% and 2.6% of the subjects.

Table 21: Distribution of foetal outcome in study group:

Foetal outcome	Number	Percentage (%)
Alive	20	52.6
Dead	18	47.4
Total	38	100

In the present study, the foetal outcome was alive in 52.6% of the cases and dead in 47.4% of the cases.

Discussion

Uterine rupture is one of the life threatening obstetric emergency accounting for 5-10% of maternal mortality. There has been an appreciable change in the etiology and the outcome in rupture uterus. The incidence of rupture has been on the gradual decline over past few decades due to advances in obstetric care while dealing high risk cases. So this study was undertaken to study the risk factors, clinical presentation, and management, maternal and fetal outcome in cases of rupture uterus. The incidence is slightly higher in our study, when

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compared to other studies like Sinha et al,[2] Vinita Bansal et al,[6] Al Zirqi et al,[4] Veena et al,[3] conducted in India. This could be because our study was conducted in one of the largest tertiary care centres in Andhra Pradesh, serving surrounding 3-4 districts. Large number of patients with various complications is referred from surrounding peripheral health centres and various private hospitals at late stages.

Most of these women are from rural areas, who do not have adequate medical and transport facilities. And they belong to low socio-economic status, so they cannot afford private transport. This can be decreased. By training ANMs, staff nurses and MBBS doctors posted at PHCs and CHCs on management of normal labour and its complications. By creating awareness regarding centrally sponsored schemes like Janani surakshayojana through which institutional deliveries are promoted by Government. Majority of cases in our study belong to the age group 20-25 years, which is similar to studies conducted in India like Rameshwari Beck et al,[7] SetuRathod et al,[5] Veena et al,[3] and Anjali Gupta et al.[8] This could be due to predominance of rural population in our study and early marriage is a common practice in rural communities.

Majority of cases in our study are unbooked (89.5%). This result is in consonance with other studies conducted by Meenakshi Singh et al,[9] Rashmi Desai et al,[10] Jain et al,[11] Anjali Gupta et al,[8] supporting the notion that lack of awareness among antenatal mothers regarding risk factors is associated with increased maternal and fetal morbidity in uterine rupture. In the present study, 34.2% of cases were referred in view of ruptured uterus from peripheral health centres, which are in contrast to other studies conducted by Rashmi Desai et al,[10] Jain et al,[11] and SetuRathod et al,[5] where more than 70% of the cases were referred. Main reasons for referral were non availability of well trained staff and necessary health care infrastructure in peripheral health care centres. Nearly 65.8% of the cases in the present study were referred in view of other reasons and were diagnosed with rupture in our institute and managed effectively with very low mortality rate. This was possible because our institute is one of the largest tertiary care centres and we have availability of experienced obstetricians, well equipped operation theatre and blood bank facilities round the clock. Increasing parity, especially grand multiparity is a known risk factor for uterine rupture. In the present study, majority of ruptured uterus occurred in women with parity of 2-4, which is similar with Tefera Marie Bereka et al,[12] Vinita bansal et al,[6] Jain et al,[11] Anjali gupta et al.[8] This trend of increased uterine rupture among women of low parity could be because of increased rate of primary cesarean section and because of increasing awareness among population regarding family planning programs, number of grand multiparous women are decreasing. The intensity of initial resuscitation plays a major role in determining maternal outcome. Late presentation to hospital was the main cause of poor prognosis, which could be due to poverty, lack of awareness to use existing antenatal services, lack of skilled birth attendant, delayed referral and poor transportation facilities Creating awareness among antenatal mothers regarding danger signs of preganncy, early anticipation of complications, prompt diagnosis and optimal management by multi-disciplinary approach in high risk cases is the key to decrease maternal mortality rate.

Similar to other research by Veena et al,[3] and Meenakshi Singh et al,[9] perinatal mortality is increased in unscarred uterus. Obstructed labour is a major cause of rupture in unscarred uteruses. The foetus is more prone to anoxia, acidosis, intracranial haemorrhage, and septicemia, leading to perinatal mortality. Emergency surgery within 30 minutes of suspected rupture is definitive treatment. Most of our study's cases are emergency referrals from distant health centres. Delay between blockage or impending rupture and delivery increases newborn mortality. Primary care centres should have adequate transportation so patients can be transferred immediately.

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Conclusion

Rupture uterus has killed countless mothers and foetuses. Obstructed and unsupervised deliveries cause less uterine ruptures. Improved obstetric treatment has led to an increase in caesarean sections and ruptured scarred uteruses. During subsequent pregnancies, expectant women should be educated about carefully supervised and scheduled deliveries in tertiary care centres. Identification of high-risk women, use of family planning services, promotion of competent birth attendants, cautious use of oxytotic medications in multiparous women, use of partograph, limiting unnecessary caesarean sections, and education about monitored delivery can reduce uterine rupture. Referring high-risk cases to tertiary care centres early can reduce maternal mortality and morbidity.

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