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MATERNAL AND FETAL OUTCOME IN CASES OF RUPTURE UTERUS: A RETROSPECTIVE STUDY

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ABSTRACT

Introduction: Uterine rupture in pregnancy is a deadly obstetrical emergency endangering the life of both mother and fetus. **Materials and methods:** The present prospective study was conducted to know the incidence, demographic distribution pattern, high risk factors associated with rupture uterus, to analyse the trends of rupture and surgical management along with morbidity, mortality and perinatal outcome over a period of 5 years. **Result:** In this study, total cases were 42,205 deliveries and 179 cases of rupture uterus. Incidence of rupture uterus per year in last 5 years. Maximum patients belong to group 21-25 years and 26-30 years respectively. Majority of patients showing increase incidence of scar rupture in cases of previous caesarean sections, which was hindu by religion, belong to rural area. In majority of patients a combination of risk factor was. there was increased incidence of scar rupture. Complete uterine rupture are mush common than incomplete rupture. Cervical / vaginal / perennial tear repair was performed in cases of rupture uterus from obstructed labour. Most common cause of maternal mortality is haemorrhagic shock. **Conclusion:** It is concluded that due to changing obstetric practices and with liberalization of practices of caesarean section, the incidence of scar rupture is on a rise and will further increase in near future therefore pregnant woman with previous scar should be given trial after proper risk assessment and also found that spontaneous rupture due to grandmultiparity, obstructed labour and malpresentation are more fatal.

KEYWORDS: rupture uterus, incidence, demographic distribution, risk factors.

INTRODUCTION

Uterine rupture in pregnancy is a deadly obstetrical emergency endangering the life of both mother and fetus. It is tearing of the uterine wall during pregnancy or delivery. Rupture of a previously unscarred uterus is usually a catastrophic event resulting in death of the baby, extensive damage to the uterus and sometimes even maternal death from blood loss. There are several factors, which are known to increase the risk of uterine rupture, but even in high risk subgroups, the overall incidence of uterine rupture is low, but still it is an alarming common catastrophic complication in developing countries were it remains the major cause of mortality and morbidity (Mishra SK, Maris N, Uprty OK) . Uterine rupture occurs depending upon standard of obstetric care and the population dealt with. Complete rupture involves the entire uterine wall and results in a direct connection between the peritoneal space and the 503 uterine cavity. From the time of diagnosis to delivery only 10-35 min are available before clinically significant fetal morbidity becomes inevitable. Fetal morbidity occurs as a result of catastrophic haemorrhage, fetal anoxia or both. The inconsistent premonitory signs and the short time for instating definitive therapeutic action makes uterine rupture a fearful event. (Bujold E, Gauthier RJ.).

An early diagnosis and prompt treatment of the condition is the most important factor in the maternal and perinatal outcome (Sahu Latika). Rupture of uterus during labour is more dangerous than during pregnancy as shock and infection is inevitable. Major patient's characteristics for determing rupture are uterine status (scarred or unscarred), myomectomy. The aims and objectives of this study was to evaluate the incidence, demographic distribution, analyse the risk factors, various types of uterine rupture and their changing trends and maternal and perinatal outcome of rupture uterus.

MATERIALS AND METHODS –analytical study of rupture uterus over a period of 5 years from1 july 2010 to 10 june 2015 in Sultana Zanana hospital, Gandhi Medical College, Bhopal in the department of obstetrics and gynaecology. The study was conducted to know the

incidence, demographic distribution pattern, high risk factors associated with rupture uterus, to analyse the trends of rupture and surgical management along with morbidity, mortality and perinatal outcome over a period of 5 years.

RESULTS

Table 1: Incidence of Rupture Uterus

S.No.	Statistical data	Number
1.	Total number of deliveries during study period	42205
2.	Total number of cases Rupture Uterus	179
3.	Incidence of rupture Uterus/Delivery	0.42 %

In this study, total cases were 42,205 deliveries and 179 cases of rupture uterus giving incidence as 0.42 % that is 1 per deliveries.

Table 2: Yearly Distribution of Cases of Rupture Uterus

S. NO.	Year (July - June)	No. of Delivery	No. of Rupture Uterus	Percentage
1	**2005-06**	**7372**	**28**	**0.37 %**
2	**2006-07**	**7395**	**31**	**0.41 %**
3	**2007-08**	**8198**	**37**	**0.45 %**
4	**2008-09**	**9415**	**38**	**0.40 %**
5	**2009-10**	**9825**	**45**	**0.45 %**
	2005-2010	**42205**	**179**	**0.42 %**

Incidence of rupture uterus per year in last 5 years, is nearly constant to 0.4% although cases of rupture have increased but there is also a simultaneous rise in total number of deliveries over the years.

Table 3: Distribution According To Age Group

S. No.	Age (yrs)	No. of cases	Percentage
1	≤20	3	1.11 %
2	21-25	76	42.45 %
3	26-30	67	37.43 %
4	31-35	23	12.84 %
5	≥ 36	10	5.58 %

Maximum patients belong to group 21-25 years i.e. 42.45 % and 26-30 years i.e. 37.43 % years when woman has her highest fertility potential.

Table 4: Distribution According To Parity

S.NO.	Parity	No. Of Cases	Percentage
1	0	1	0.5 %
2	1	70	39.1 %
3	2	47	26.2 %
4	3	28	15.6 %
5	4 and above	33	18.4 %

Majority of patients belongs to group para 1, para 2 i.e. 39.1% and 26.2% respectively showing increase incidence of scar rupture in cases of previous caesarean sections, there was one case of spontaneous rupture uterus in nulliparous patients due to obstructed labour.

Table: 5 Distribution According To Religion

S.NO.	Religion	No. Of Cases	Percentage
1	Hindu	143	79.88 %
2.	Muslim	36	20.12 %

Majority of patients' i.e 79.88 %. were hindu by religion.

Table 6: Distribution According To Residential Area

S.NO.	Residence	No. Of Cases	Percentage
1	Rural	121	67.60 %
2.	Urban	58	32.40 %

Majority of patients belong to rural area i.e. 67.60% mostly from villages and district outside Bhopal.

Table 7: Booking Status

S.NO.	Booking status	No. Of Cases	Percentage
1	**Booked**	**38**	**21.22 %**
2.	**Unbooked**	**141**	**78.78 %**

Majority of patients are unbooked (78.78%) thus poor antenatal care is reflected in the higher incidence of Rupture uterus.

Table no. 296: Referral status

S.NO.	Referred status	No. Of Cases	Percentage
1	Total Cases of Rupture Uterus	179	
2.	Total Referred Cases (a) Inside Bhopal (b) Outside Bhopal	116 30 86	64.80 % 25.86 % 74.14 %

Major bulk of the patients were referred (64.80%) of which 74.14% patients were from outside Bhopal.

Table no. 296: **high risk factor for rupture uterus**

S. NO.	Risk Factor	No. of Cases	Percentage
1	Previous Caesarean Section • Previous 1 LSCS • Previous 2 LSCS	93 67 13	51.95%
2	Multiparity	51	28.49%
3	Obstructed Labour	29	16.20%
4	Malpresentation • Transverse Lie • Breech	16 13 3	8.93%
5	Accidental Hemorrhage	9	5.02%
6	Prolonged Labour	3	4.46%
7	Multiple Pregnancy	2	1.11%
8	Obstetric Manipulation (Internal Podalic Version)	1	0.55%

Previous caesarean scar was the most important risk factor accounting for % of cases followed by muliparity and obstructed labour ie. 28.4% & 16.2% which were responsible factor for spontaneous rupture. In majority of patients a combination of risk factor were present for example multiparity, malpresentation and obstructed labour.

Table 10 Changing Trend In Type Of Rupture Uterus Over The Period Of 5 Years

S. NO.	Year	Scar Rupture	Spontaneous Rupture
1	2005-06	9	19
2	2006-07	17	14
3	2007-08	20	17
4	2008-09	18	20
5	2009-10	29	16

Over the year the cases of scar rupture has increased due to increasing caesarean deliveries whereas there is slight decline in cases of spontaneous rupture from obstructed labour, prolonged and malpresentations.

Table no. 297: **type of rupture uterus**

S.NO.	Type of Rupture	No. of Cases	Percentage
1	Scar Rupture	93	51.96 %
2	Spontaneous Rupture	86	48.04 %

There is increased incidence of scar rupture i.e. 55.86% due to increasing rate of caesarean sections over the years.

Table no. 297: **type of rupture uterus**

S.NO.	Type of Rupture	No. Of Cases	Percentage
1	Complete Rupture	139	77.71 %
2	Incomplete Rupture	40	22.39 %

Complete uterine rupture are mush common i.e. (77.71%) than incomplete rupture.

Table no. 297: **postnatal rupture**

S.NO.	Type of Rupture	No. Of Cases
1	Total Cases Of Postnatal Rupture a. Delivered in other hospitals b. Delivered at home c. Delivered at SZH	11 05 03 03

Postnatal rupture was found in 11 cases, of which 5 had delivered in other hospitals, 3 had home deliveries by dai while 3 had delivered at Sultana Zanana Hospital, which 2 had scar rupture in case of prev 1 LSCS and prev 2 LSCS respectively and one case of spontaneous rupture in prostaglandin (PGF2) inducted patient.

Table no. 297: **Type of surgery**

S.NO.	Type of Surgery	No. of Cases	Percentage
1	Uterine/Scar Repair	94	53.11 %
2	Obstetric Hysterectomy	83	46.89 %
3.	Other Additional Surgery ● Bladder Repair ● Cervical Tear Repair ● Vaginal Wall tear repair ● Complete Perenial tear repair	 30 13 10 5 2	

Uterine / scar repair was done in 53.11% while obstetric hysterectomy was done in 46.89% of cases, which shows that conservative mode of surgery i.e. repair was done commonly owing to greater incidence of scar rupture in previous caesarean cases. Most common additional surgical procedure was repair of rupture bladder i.e. 13 cases. Cervical / vaginal / perennial tear repair was performed in cases of rupture uterus from obstructed labour.

Table no. 297: **Causes of maternal morbidity**

S.NO.	Causes	No. of Cases
1	Anaemia	70
2	Febrile illness	29
3	Wound Sepsis	20
4	UTI	14
5	Coagulopathy	05
6	Burst Abdomen	02

It was noted that those cases that had complications usually had a combinations of them. For example febrile illness, wound infection and burst abdomen. Important underlying causes of higher maternal morbidity were anaemia and sepsis.

Table no. 16: incidence of maternal mortality

Total number of cases of rupture uterus	179
Total number of maternal deaths	13
Incidence of maternal mortality	7.26 %

Total 13 mortality occurred in cases of rupture uterus during the study period giving an incidence of 7.26% of which 12 maternal death were of spontaneous ruptures due to obstructed labour and grandmultiparity while only 1 maternal death was due to scar rupture.

Table no. 17: causes of maternal mortality

S. NO.	Causes	No. of Cases	Percentage
1	Haemorrhagic Shock	09	69.23%
2	Septicemia	02	15.38%
3	Disseminated Interavascular Coagulopathy	01	7.69%
4	Pulmonary Embolism	01	7.69%

Most common cause of maternal mortality is haemorrhagic shock, accounting for 61.23% of total maternal mortality.

Table no. 18: perinatal outcome in cases of rupture uterus

S.NO.	Perinatal Outcomes	No. of cases	Percentage
1	Still Born	129	71.9 %
2	Alive	38	21.2 %
3	Neodeath	12	6.7 %

Majority of babies i.e. 71.9% were still born and only 21.2% were born alive and healthy, Neonatal death occurred in 6.7% of cases. Fetal mortality in cases of uterine is very high hence the importance of early operative interference.

Table no. 19: weight of baby

S.NO.	Weight of baby	No. of Cases	Percentage
1	**≤2 kg**	**9**	**5.05%**
2	**2.1-2.5 kg**	**45**	**25.28%**
3	**2.6-3 kg**	**57**	**32.02%**
4	**≥3 kg**	**67**	**37.65%**

Most of the babies i.e. 37.65% had birth weight ≥3kg hence incidence of rupture was high in patients with babies of high birth weight due to cephalopelvic disproportion.

DISCUSSION

During the study from 1St July 2005 to 30Th June 2010, there were 42,205 deliveries out of which there were 179 cases of rupture uterus, accounting for an incidence of 0.42% i.e. 1 per 236 deliveries.

Comparative Incidence of Rupture Uterus

S.No.	Authours	Incidence
1.	*Khanan RA et al.[9] (2001)*	*1.06%*
2.	*Aboyeji AP et al.[8] (2001)*	*0.23%*
3.	*Khan S. et al[10] (2003)*	*0.98%*
4.	*Adam RM et al.[66] (2003)*	*0.23%*
5.	*Mishra SK et al.[1] (2006)*	*0.33%*
6.	*Dhaifalah I et al.[67] (2006)*	*0.63%*
7.	*Present Study (2010)*	*0.42%*

Incidence of rupture in various countries

S.No.	Developed Countries		Developing Countries	
1.	*Australia*	*0.086 %*	*Pakistan*	*0.98%*
2.	*Netherlands*	*0.058 %*	*Nigeria*	*0.47%*

3.	*Canada*	*0.033 %*	*Nepal*	*0.63%*
4.	*Ireland*	*0.023 %*	*Ethiopia*	*0.57%*
5.	*Qatar (UAE)*	*0.17 %*	*Present Study (India)*	*0.42%*

Incidence of rupture uterus in present study correlates well with incidence in developing countries due to various socio – economic factors like illiteracy, low socioeconomics status, malnutrition, lack of proper antenatal care, unsafe deliveries, weakness of referral service and lack of access to health service.

Age: Shipp et al. showed that increasing maternal age had detrimental effect on the rate of uterine rupture. In a multiple logistic regression analysis the overall rate of uterine rupture in 3015 woman was 1.1% the rate of rupture in woman older than 30 years (1.4%). Versus younger woman <30 yrs (0.5%) differed significantly.

Parity: High parity is still a predisposing factor spontaneous ruptures in india. Schrinsky and Benson found that 7 to 22 women (32%) who had unscarred uterine rupture had a parity of 4 and more. Golen et al. (1980) noted 31% (19 of 61 cases) uterine rupture occurred in woman with a parity of 5 or more.[15] In present study grandmultipaity was found to be strongly associated with increased risk of uterine rupture in 18.4% cases due to obstructed labour, prolonged labour and malpresentation and hence the importance of fertility regulation and contraception usage could be clearly concluded. In present study higher incidence of scar rupture was found in group para 1 and para 2 i.e. 39.1% and 26.2% respectively due to increase in incidence of scar rupture in previous cesarean sections.

Residential Area: In present study of patients belongs to rural areas i.e. 67.8% as ours is a tertiary care centre that mostly receives patients from primary health center and district hospitals in and around Bhopal. n unfortunate feature of current obstetric care is that most primary and secondary health care facilities are not capable of providing emergency caecarean section. Thes leads to either injudicious intervention and/or further delay in transferring to a higher centre, lack of access to transport facilities and lack of knowledge about health services in rural areas further aggravate the condition.

Antental Booking: Present study shows that more than two thirds of the patients i.e. 78.7% had never had any type of proper routine antenatal care during thjeir pregnancy. The rest attended inadequate antental care, indicating that patients are reluctant to seek health services (informational, financial or physical) provided by Government that played a major role as a risk factor for uterine rupture. This study confirms the important routine antental screening of all high risk pregnancies and their timely referral to higher center for delivery as also stated in the literature by Zanconato et al. (1994) where 76 % of the woman were unbooked.

Referral Status: Though maternal mortality due to rupture uterus has reduced due to referral, but still timely referral is to be emphasized so as to improve maternal and perinatal outcome. In present study major bulk of the patients were referred i.e. 64.8% particularly from outside Bhopal as Sultania Zanana Hospital is a higher referral centre in Bhopal. Mishra S.K. et al. (2006) in his study on uterine ruture: preventable obsterictragedies also found that 35 out of 52 woman (67.3%) with uterine rupture were referral to BP Koirala Institute of Health Sciences. Pregnant woman with risk factors for uterine rupture should have an early referral to higher center, so as substantially reduce the incidence of this fearful obstetric complication.

Risk Factor: The effect of previous caesarean delivery on the risk of uterine rupture has been studied extensively. For the woman with a prior uterine scar, neither repeat elective caesarean birth nor vaginal birth after caesarean birth (VBAC), trail of labour (TOL) is risk free. When VBAC, trial of labour is successful, it is associated with less morbidity than repeat caesarean birth, however when VBAC-TOL fails due to uterine rupture, severe consequences occus. In present study previous caesarean delivery constitutes as the highest risk factor for rupture uterus (Scar Rupture) i.e. 51.9% all of which were low transverse caesarean sections.

Such strong correlation was also found in studies by M.H. Alsalem et al (2000) who found scar rupture in 51% cases. Al Sakka M et al (1999) showed in his study that previous caesarean scars were present in 47% cases. While study by Sangeeta K. Mishra et al (2006) showed only 19.2 % association of previous caesarean section with rupture uterus. Thus challenge for obstetrician today is to provide woman, who desire VBAC-TOL a more individualized risk assessment of rupture, thereby enhancing success and optimizing outcome. In present study, multi parity (24.49%) obstructed labour (16.2%) mal presentation (8.93%) were other important risk factor which was particularly responsible for spontaneous ruptures. In study by Dhaifalah et al (2006), obstructed labour was found in 83% cases of spontaneous rupture. Thus, risk factor like multiparity, obstructed labour and neglected labour which were previously more common causes of rupture uterus due to higher incidence of unscarred rupture are now over the years replaced by previous caesarean scar as the most important risk for uterus due to increased incidence of scar rupture.

Types of Ruptures: With liberalization of caesarean deliveries in present day obstetrics, a changing pattern in the type and cause of uterine rupture has been observed. In present study, the cases of scar rupture per year have

increased over a period of 5 years due to increasing rates of caesarean sections, while cases of spontaneous ruptures per year is showing a slight decline. In present study the incidence of scar rupture was 51.9% as compared to incidence of spontaneous rupture i.e. 48.04% which is in accordance with study by M.H. AlSalem et al (2000) who found scar rupture in 56% cases in contract to 44% cases showing unscarred rupture. While M. Al Sakka et al.(1999) found 10 cases (43.5%) of rupture uterus in patient with previous caesarean section scar while 13 cases (56.5%) had spontaneous rupture.

While other study proved higher incidence of unscarred rupture like Khan S. et al. (2003), out of 34 cases 29 rupture (85.3%) occurred in unscarred uterus while '5' rupture (14.7%) occurred with previous scar. Complete ruptures are more dangerous and have higher rate of maternal and prenatal mortality. In present study, post natal Rupture was found 11 cases of which '5' had delivered in other hospitals, 3 had come delivers by dai, while 3 had delivered at Sultana Zanana Hospital, Bhopal, of which '2' had scar rupture in e of previous one LSCS and previous two LSCS respectively and one case of spontaneous rapture in cerviprime (prostgalndin) induced patient.

Management of Rupture Uterus: In present study uterine / scar repair was performed in 53.11% cases while obstertric hysterectomy in 46.89% cases which correlates well with study by Al Sakka M et al (1999) were hysterectomy was performed in 8 out of 17 cases (47%) repair with sterilization was done in remaining 11 cases (53%). Thus, conservative surgery like uterine repair is more commonly performed due to greater incidence of scar rupture. Among additional surgeries bladder repair was most commonly performed 13 cases, while cervical tear repair 10 cases, veginal wall tear repair 5 cases and complete perineal tear repair in 2 cases.

Maternal Outcome: In present study maternal mortality due to rupture was 7.26% (13 out of 179 cases). Out of 13 maternal deaths, 12 were of spontaneous ruptures due to obstructed labour and grandmultiparity while only 1 maternal death was due to scar rupture.Hence in present study spontaneous rupture from obstructed labour and grandmultiparity are leading cause of maternal death, as compared to scar rupture which coincides with study by Golen et al (2001) who reported no deaths among 32 mothers who experienced rupture of a scarred uterus compared with 9 deaths among 61 woman with an intact uterus (15%). Aboyeji AP et al. (2001) showed maternal mortality was 13% (13 death in 100 cases of uterine rupture). In present study most common cause of maternal mortality was haemorrhagic shock (69.2%) other causes were septicemia (15.3%), DIC (7.6%) pulmonary embolism (7.6%). In a 53 years review by Eden et al. their observed incidence for haemorrhagic shock was 46% (11 of 24 cases). Maternal death as a consequence of uterine rupture at a rate of 0-1% in modern developed nations, but the mortality rates in developing countries are 5-10%. In present study important underlying causes of higher morbidity were anemia and sepsis. Blood transfusion was required in 85 patients i.e. 45.8 %. Keiser and Baskett found 44% (8 of 18 patients) who had a complete rupture required blood transfusion.

Perinatal Outcome: In present study majority of babies 71.9 % were still born and only 21.2% Were born alive, while neonatal death occurred in 6.7% if cases. In studies reported before 1978 the fetal mortality rate associated with uterine rupture was high. In a review of 33 studies by Schrinsky and Benson 960 cases of uterine rupture resulted in 620. Perinatal deaths, yielding a perinatal mortality rate of 65%. In study by Sangeeta K. Mishra et al. (2006) perinatal mortality was as high as 94.2%. Isharaq et al. (2006) found fetal death in 54.3% and survival in 45%. In Present study (37.65%) of cases had fetal weight $\geq$ 3 kg. Fetal weight is a risk as it contributes to cephalopelvic disproportion and higher incidence of uterine rupture. High perinatal mortality in present study proves that early timely referral to higher in case of uterine rupture is essential to minimize the risk of fetal loss.

CONCLUSION

Hence from the present study it is concluded that due to changing obstetric practices and with liberalization of practices of caesarean section, the incidence of scar rupture is on a rise and will further increase in near future therefore pregnant woman with previous scar should be given trial after proper risk assessment and only in set up where 24 hrs emergency services for caesarean section, laparatomy and blood transfusion are available including competent gynecologist. It has been found in present study that spontaneous rupture due to grandmultiparity, obstructed labour and malpresentation are more fatal as compared to scar rupture therefore pregnancies with high risk factors for spontaneous rupture should have an early referral to tertiary care centre, So as to improve maternal and fatal outcome in cases of rupture uterus.

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