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Original Research Article

Changing trends in uterine rupture audit, from the Institute of obstetrics and gynecology, modern government maternity hospital, Osmania medical college

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ABSTRACT

Background: Between January 2001 to September 2003, 46,171 deliveries were recorded, the number of caesarean deliveries during this period of two years and nine months were 16,182 (35.04%).
Methods: An Audit from the Institute of obstetrics and gynecology, of uterine ruptures.
Results: Total 81 cases of uterine rupture were managed at the Institute. Total number of scar ruptures managed were, 48/81 uterine ruptures. Five women had previous classical upper segment caesarean, and in previous lower segment caesarean section (LSCS), there were 43 cases of rupture uterus. In two cases following forceps delivery, traumatic uterine ruptures were recorded. Spontaneous ruptures were 31 during the study period. Bladder rupture occurred in 13 cases, 16.04% of uterine ruptures. The fetal outcome in uterine ruptures 81 cases, live births were 19-23.45%. The number of vaginal births after caesarean section were 261, 215, 186 in the years 2001, 2002 and 2003 at the Institute of obstetrics and gynecology. The number of scar ruptures were 7/261, 9/215, 2/186 in the respective years. Hysterectomy was done in 43/81=53.08%. Rent repair of the uterine rupture was done in 38/81.
Conclusions: An Audit from the Institute of obstetrics and gynecology, of uterine ruptures has provided the following data that gives an insight into the practice of obstetrics during the decade 2000 to 2010 in the teaching Institute. Caesarean deliveries accounted for 35.04% of the total deliveries. Repeat caesarean sections were 7105, 43.9%. The number of vaginal births after caesarean section (VBAC) were 662. Scar ruptures in VBAC were 18 /662-2.71%. The maternal mortality in MGMH study was 3/81 uterine ruptures-3.7%. Scar ruptures constituted, 48/81-59.25% of uterine ruptures. Trial of labor after caesarean (TOLAC) and VBAC are practiced in the teaching Institute.

Keywords: Bladder injuries, Obstetric hysterectomy, Post-partum haemorrhage, Rupture uterus, Scar rupture, Vaginal births after caesarean section

INTRODUCTION

Obstructed labour and Bandles ring have become a thing of the past. During the seventies and eighties as undergraduates, postgraduates and assistant professors in obstetrics and gynecology, we would learn about all the features of obstructed labour, uterine rupture, and vesico vaginal fistulae resulting from ischemic pressure necrosis. Since we could see these cases, it was easy to diagnose these conditions with history and a glance at the woman in labour.

Now with increasing safety of anesthesia, antibiotics to prevent sepsis, cutting short the agony of labouring of the woman in labour, at the same time reducing the duration of labour to the time of caesarean, from 8 to 10 hours of labour to 30 minutes to one hour duration of caesarean, reducing the labour of the attending obstetrician have all

contributed to abdominal deliveries to increase from 5% in 1974 to 35% in 2014 (Institute data). Uterine rupture is the most serious and life-threatening complication and occurs in 0.7-0.9% of vaginal birth after lower segment caesarean section.[1]

As per Al-Zirqi et al the incidence of uterine rupture increased sharply from 0.9/10 000 in the second decade (1978-1988) to 6.1/10 000 in the fourth decade (2000–2008), showing a significant linear trend). The incidence was considerably greater in the subgroup of women with scarred uteri, increasing sharply from 14.2/10 000 in the second decade to 66.8/10 000 in the fourth decade. [2]

Al-Zirqi et al identified 359 uterine ruptures among 1 441 712 maternities; the incidence was 2.5/10 000. Sixty-five ruptures (0.5/10 000) occurred in intact uteri (n=1362475), and 294 ruptures (37.1/10000) occurred in scarred uteri (n=79 237). [2]

Nine of the 294 ruptures occurred after previous myomectomy and removal of corneal pregnancies, whereas the remaining ruptures occurred after previous caesarean section.[2]

An Agency for Healthcare Research and Quality (AHRQ) sponsored summary about trial of labor (TOL), found no maternal deaths from uterine rupture among patients with term pregnancies.[3]

This report calculated that the overall maternal mortality was 13.4 per 100,000 for elective repeat cesarean delivery (ERCD) and 3.8 per 100,000 for TOLAC.[3] The rates of hysterectomy, hemorrhage, and transfusions did not differ significantly between TOLAC and ERCD.

Although maternal mortality is reduced by choosing TOLAC over ERCD, this choice is associated with increased fetal mortality. ERCD is associated with 0.5 perinatal deaths per 1000 births compared with 1.3 perinatal deaths per 1000 TOLAC births. [3]This TOLAC perinatal mortality rate is comparable to the perinatal mortality rate of laboring nulliparous women.[4]

Morbidly adherent placenta

Placenta percreta is the most invasive form of placenta accreta spectrum (PAS) disorders, where the villous tissue is found to invade the full thickness of the uterine wall through the serosa.[5]

Spontaneous uterine rupture due to placenta percreta principally occurs during the third trimester, as the risk of UR due to placenta percreta in the second trimester is very low. [6]

Previous surgeries on the uterus

Our obstetricians must keep in mind that laparoscopic surgeries, such as myomectomy or salpingectomy, entail risk factors for uterine rupture, UR. At the same time, hysteroscopic surgeries, such as myomectomy and septum resection, are also known risk factors for UR in pregnancy.[7,8]

Previous surgeries on the uterus also increase the risk of morbidly adherent placenta.

Several factors may be responsible for rupture of the uterus, including advanced maternal age, macrosomia, a shorter interval of deliveries, single-layer uterine closure, a high incision in the lower uterine segment, multiple previous cesarean deliveries, trial of labor after cesarean.

It is necessary to elicit the history of any surgeries on the uterus prior to conception, in addition to the above-mentioned conditions, a history of uterine curettage, evacuation after abortion and surgical methods of first trimester pregnancy termination procedures, surgeries for second trimester pregnancy termination and efforts to remove placenta after abortion. The damage done to the uterine wall during these procedures may not be recognized but could be responsible for the so-called spontaneous ruptures in labour. History, medical is of great importance, significant in medical diagnosis.

METHODS

At the Institute of obstetrics and gynaecology, MGMH/ Osmania Medical College, during a period of two years and nine months, from Jan 2001 to Sept. 2003, there were a total of 46,171 deliveries. During this period out of a total 16,182 caesarean deliveries, the number of repeat caesarean sections were 7105.

An analytical observational study was conducted to probe the cases of uterine ruptures managed during the study period.

The inclusion criteria were all cases admitted as uterine rupture in an emergency state, both booked and unbooked. The cause of uterine rupture whether following a previous caesarean delivery or following induction or augmentation of labour or forceps application were noted, uterine ruptures that occurred during labour in the hospital were also included. A written consent was taken from the woman for vaginal birth after caesarean section, (VBAC) after explaining the adverse outcomes that may occur, previous caesarean delivery cases allowed vaginal birth after caesarean, were monitored closely and the number of uterine ruptures that occurred in the Institute following VBAC after trial of labour, TOLAC were documented and included in the study, An attempt was made to analyse uterine ruptures in previous caesarean deliveries, and in 81 uterine ruptures, regarding the perinatal mortality, associated injuries to bladder, vagina, urethra, broad ligament and the management adopted. The feasibility of rent repair, the need for performing sterilization by tubectomy at the time of rent repair, or not perform a bilateral tubectomy

operation thereby preserving spontaneous fertility and future conception and the maternal mortality in these obstetric emergencies were analysed and compared with similar published studies.

Exclusion criteria were emergency obstetric admissions other than uterine rupture. Prior permission and approval were accorded for this study by the Institute ethics committee.

At the Institute VBACS were conducted. Use of oxytocin for induction of labour was permitted. Prostaglandins were not used for labour induction in previous caesareans. Outlet forceps was applied if needed, but not in all cases. In house senior obstetricians, anaesthetists, sonologist, blood bank facilities were available 24×7/365/year. Surgeons, urologists were available 24×7, from Osmania General Hospital, both Institutes being a part of Osmania Medical College.

For the booked cases at the institute, the investigations for the pregnant women would be done as per hospital protocol. Each patient would have a minimum three scans; hence the location of the placenta and adherent placenta would be identified. Colour doppler facilities are available at the Institute from the nineteen nineties. Intrapartum fetal heart monitoring was done using the Pinards fetuscope. Fetal doptone was used when available. Fetal biophysical profile was done if needed. Even the referral cases would have antenatal check-up and investigations done, including scans. At admission, all emergency investigations would be done, including clotting time, bleeding time.

An attempt was made to identify the injuries to the surrounding organs, otherwise they would lead to infection necessitating a second surgery with may be suboptimal results, and sometimes with debilitating consequences like vesico vaginal fistula, dyspareaunia, urinary incontinence. In cases following traumatic uterine rupture, following forceps or vacuum delivery, advisable to look for perineal tears, involving anal sphincter, labial haematoma.

In two cases of uterine ruptures that were recorded intrapartum, oxytocin infusion was used for augmentation of labour. At our institute oxytocin was employed in indicated cases, in cases of previous one caesarean section, though with caution and trepidation too, but with vigilant supervision. Prostaglandins even dinoprostone gel was not used in previous c.section cases at the institute.

RESULTS

Statistics from the Institute of obstetrics and gynaecology January 2001-September 2003

For two years and nine months period, in MGMH there were a total of 46,171 deliveries. Out of a total 16,182 caesarean deliveries, the number of repeat caesarean sections were 7105. The number of VBACS were 662. The scar ruptures were 18/662-2.71%. Booked versus emergencies: Uterine ruptures in booked cases were 26/81, 32.09% and emergency admissions, that were unbooked, were 55/81-67.9% (Table 1).

Table 1: Booked versus emergencies-81 cases of uterine rupture.

Type of admission	Total number	Percentage%
Booked cases	26	32.09
Emergencies	55	67.9

Uterine ruptures in 2 years and 9 months

The number of vaginal births after caesarean section were 261, 215, 186 in the years 2001, 2002 and 2003 at the Institute of obstetrics and gynaecology, MGMH /OMC. The number of scar ruptures were 7/261, 9/215, 2/186 in the respective years Table 2.

Table 2: VBAC, scar ruptures and live births in scar ruptures: 2001-2003.

Year	VBAC section no. 662	Scar ruptures	Live births in scar ruptures
2001	261	7	5
2002	215	9	6
2003	186	2	2

Causes of uterine rupture in 81 cases-MGMH / OMC

Total number of scar ruptures during two years and nine months were 48/81. There were five women who had previously classical upper segment caesarean done and had uterine rupture in the current pregnancy. Following previous LSCS, there were 43 cases of rupture uterus. In two cases following forceps delivery, traumatic uterine ruptures were recorded. Spontaneous ruptures were 31 during the study period Table 3.

Table 3: Causes of uterine rupture in 81 cases.

Causes	Total no.	Percentage
Spontaneous rupture uterus	31	38.27
Traumatic rupture	2	2.46
Scar rupture	48	59.25
Previous LSCS	43	53.08
Previous classical caesarean scar	5	6.17

Uterine rupture-associated injuries

Bladder rupture was the most common associated injury that occurred in 13 cases of rupture uterus, 16.04% of

uterine ruptures, 3 cases were in spontaneous rupture uterus and 10 cases followed scar ruptures. In addition to bladder injuries in cases of uterine rupture, there were associated broad ligament haematoma in seven, vaginal tear in 8 and urethral tear in one Table 4.

Table 4: Uterine rupture-associated injuries.

Associated injuries	Total no	Percentage
Bladder rupture	13	16.04
following spontaneous rupture	3	3.70
following scar rupture	10	12.34
Urethral tear	1	1.23
Broad lig. Haematoma	7	8.64
Colporrhexis	8	9.87

Analysis of ruptures occurring in the Institute total 26

Of the 26 cases of uterine ruptures recorded at the Institute, MGMH, 18 were in previous caesarean section cases, 2 were due to traumatic causes and in 6 were following spontaneous labour and delivery. Forceps application or instrumental delivery were associated with uterine rupture in 6 cases and oxytocin infusion was associated with uterine rupture in two. The babies were born alive in 14/26 and stillbirths were in 12/26 cases. Table 5

Table 5: Analysis of ruptures occurring in the Institute, total 26.

Aetiology of rupture	Total no.	Live births	Stillbirths
Type of rupture 26			
Spontaneous	6	1	5
Traumatic	2	-	2
Scar	18	13	5
Scar ruptures			
1 previous caesarean	15	11	4
2 previous caesarean	3	2	1
Cause of rupture			
Oxytocin	2	1	1
Instrumental delivery	6	5	1

Perinatal and maternal outcome in 81 cases

The fetal outcome in uterine ruptures in 81 cases: Fetal outcome, live births were 19-23.45% and still births were 62-76.54%. One significant point is that 14/19 live births occurred in uterine ruptures that happened in the Institute indicating timely and immediate emergncy caesareans could save the fetus.

There can be associated maternal morbidity in uterine ruptures. In this study, there was one DVT and two VVF resulting from bladder injury repaired, still resulted in vesico vaginal fistula in two women. One woman had postpartum psychosis treated after consultation of the psychiatrist attached to Osmania medical college. There was wound sepsis in one, treated. Table 6

Table 6: Perinatal and maternal outcome in 81 cases.

Perinatal and maternal Outcomes	Number	Percentage
Fetal outcome		
Live births	19	23.45
Still births	62	76.54
Maternal morbidity		
DVT*	1	1.23
VVF**	2	2.46
Postpartum psychosis	1	1.23
Wound sepsis	1	1.23

* DVT: Deep vein thrombosis, **VVF: Vesico vaginal fistula.

Surgical management of rupture uterus after the delivery of the foetus

Hysterectomy was done in 43/81=53.08%. Hysterectomy was total in 20 and subtotal in 23 cases. Rent repair of the uterine rupture was done in 38/81, with tubal ligation in 24 and without tubal ligation in 14 cases. Bladder repair was done in 13, urethral repair in one case, colporrhexis repair was done in 8 cases. Unilateral salpingo oophorectomy was done in 5 cases when there was bleeding or tear involving the tubes and ovaries. Table 7

Table 7: Surgical Management of uterine rupture after the delivery of the baby (n=81).

Surgical Management	Total no.	Percentage
Rent repair	38	46.91
With tubal ligation	24	29.62
Without tubal ligation	14	17.28
Hysterectomy	43	53.08
Total	20	24.69
Sub total	23	28.39
Associated surgery		
Bladder repair	13	16.04
Urethral repair	1	1.23
Salpingo oophorectomy	5	6.17
Colporrhexis repair	8	9.87

Maternal mortality in our study of uterine rupture in 81 cases 2001-03

The maternal mortality in study was 3/81-3.7% Table 8.

Changing trends in uterine rupture- Indian studies

In MGMH study, scar ruptures account for 48/81 rupture uterus -59.25%, in the years 2001 to 2003 Table 9.

Table 8: Maternal mortality in this study 2001-03. 3/81 = 3.7%

Study	Total no. of cases	Maternal deaths	Percentage
Beena Naik 1984-95	168	14	8.33
Kulkarni 1986-95	145	8	11.33
Wakode 1994-97	37	2	5.41
Our study 2001-3	81	3	3.7

Table 9: Changing trends in uterine rupture- Indian studies.

Study	Beena Naik 1984-95		Kulkarni 1986-95		Wakode 1994-97		This study 2001-03	
	N	%	N	%	N	%	N	%
Total number of cases	168		145		37		81	
Booked cases	21	12.5	1	0.68	2	5.4	26	32.09
Scar ruptures	37	22.02	26	18.63	11	29.73	48	59.25
Bladder ruptures	17	10.12	3	2.06	6	16.22	13	16.04
VVF	6	3.97	-	-	2	5.41	2	2.46
Maternal mortality	14	8.33	8	11.33	2	5.41	3	3.7

DISCUSSION

Scar ruptures were the most common cause of uterine ruptures at the Institute. Greater number of previous one caesarean as a cause of uterine rupture, is due to greater number of cases of previous one caesarean, and trial of labour following caesarean delivery (TOLAC) was given at the institute only in these cases (VBAC) , and elective caesarean sections were performed in two previous c.sections.

Changing trends in uterine rupture-Indian studies

In MGMH study, scar ruptures accounted for 48/81 rupture uterus-59.25% in the years 2001 to 2003. Scar ruptures accounted for 37/168-22.02% in Beena Naik study, 26/145-18.63% in Kulkarni study, and 11/37-29.73% in Wakode study.[9,10,11] Compared to the earlier studies, the percentage of scar rupture, 59.25% in this study is more Table 9.

This indicates a reduction in the numbers of spontaneous ruptures due to a greater resort to caesarean delivery in suspected cephalo pelvic disproportion that may lead to obstructed labour and rupture uterus. At the same time scar ruptures increased due to an attempt at vaginal delivery in cases of previous caesarean delivery.

The number of bladder ruptures also increased in cases of scar ruptures.

In ruptures occuring in the institute, it is significant to observe that in 13/18 scar ruptures, the babies were born alive which indicates that foetal distress was noted and immediate caesarean was done. Indicates that careful vigilance could save the fetuses.

We have observed that in some , elective abdominal delivery would have been planned, the woman sets into spontaneous labour and an emerrgency caesarean performed at the onset of labour would save the fetus but we would find at caesarean delivery, already the scar had given way and there would be a breach in the contiguity of the muscular layer and the preitoneal layer.

Total live births were 19/81 uterine ruptures. The emergency surgeries were done soon enough to save the foetus. It is this obstetric care we wish to deliver to our women. It is not always possible to prevent uterine rupture following previous caesarean sections.

With the onset of labour contractions, preterm sometimes, the woman being at home, the time taken to reach the hospital, for assessing the case, the arrangement for immediate surgery would all matter. By the time the fetus is delivered, certain number of uterine ruptures would inevitably occur in pregnancies following previous caesarean delivery. This information is of great importance, especially in the scenario of increasing number of abdominal deliveries.

Surgical management of rupture uterus after the delivery of the baby

Hysterectomy was done in 43/81=53.08%. Hysterectomy was total in 20 and subtotal in 23 cases. Rent repair of the uterine rupture was done in 38/81, with tubal ligation in 24 and without tubal ligation in 14 cases. So, in the final analysis of uterine ruptures, in only 14/81 women, the chance of spontaneous conception and delivery was preserved.

Maternal mortality in our study of uterine rupture in 81 cases 2001-03

The maternal mortality in MGMH study was 3/81-3.7%. This is lower than other studies, 8.33%, 11.33%, and 5.41%[9,10,11] reported by other studies. Table 8

I Al-Zirqi, in his article on uterine rupture: trends over 40 years[2] remarks that, uterine rupture is rare in Norway, but there has been a sharp increase in recent years. This increase was partly linked to increases in scarred uteri (as a result of increasing rates of caesarean section), induced labour with prostaglandins or combined prostaglandins and oxytocin, and augmented labour with oxytocin.

The substantial increase of uterine rupture incidence in scarred uteri indicates the need for revisiting the management of labour in this group. I Al-Zirqi, recommends not only a need for strict selection criteria for TOL, but also a stricter use of induction and augmentation. Reducing the non-medically indicated first caesarean section may also reduce the rates of uterine rupture. They observed a decrease over time in serious outcomes following complete ruptures, such as severe postpartum haemorrhage, hysterectomy, and intrapartum/infant deaths.[2]

Incidence of bladder rupture associated with uterine rupture was 8-15% in various studies.[12,13] Bladder rupture was the most common associated injury that occurred in 13 cases of rupture uterus, 16.04% f uterine ruptures in this study and 10 cases followed scar ruptures. The bladder could be adherent to the lower uterine segment scar and involvement of the bladder in rupture could be more.

Gross haematuria is the most common sign of uterine rupture associated with bladder rupture.[14] Oliguria, anuria and frank hematuria should alert the surgeon to the possibility of bladder involvement in uterine ruptures.

The case report described a rare case of vesico uterine rupture with avulsion of ureter following vacuum assisted delivery in a grandmulti with previous lower segment cesarean section (LSCS).[15]

CONCLUSION

An Audit from the Institute of obstetrics and gynecology, of uterine ruptures has provided the following data that gives an insight into the practice of obstetrics during the decade 2000 to 2010 in the teaching Institute. Caesarean deliveries accounted for 35.04% of the total deliveries. Repeat caesarean sections were 7105, 43.9%. **T**he number of VBAC were 662. Scar ruptures in VBAC were 18 /662-2.71%. The maternal mortality in MGMH study was 3/81 uterine ruptures-3.7%. Scar ruptures constituted, 48/81- 59.25% of uterine ruptures. TOLAC and VBAC were practiced in the teaching Institute.

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