

A Study of 160 cases of uterine rupture

Abstract

Introduction: Uterine rupture is a serious emergency in obstetrics and a life-threatening situation.

Material and Methods: It is a retrospective cohort study conducted at Lady Willingdon Hospital in Lahore for a period of 14 years from Jan 2004 to December 2017.

Results: The incidence of uterine rupture was 0.9%. The highest number of uterine ruptures occurred in women > 35 years, the majority occurred in women para 5 and above; 53 (33.1%). Seventy percent of patients had previous uterine scar from myomectomy or Caesarean Section (CS). Obstructed labour was found among 14(8.8%) patients and precipitate labour among 12(7.5%) patients. There were 160 cases uterine rupture, 15 were unrepairable and underwent total or subtotal hysterectomy. 145 were repairable. The commonest site of rupture was transverse 92(63.4%), grand multigravida with transverse rupture and those with fundal rupture had repair and bilateral tubal ligation 12(8.3%) and 19(13.1) respectively. Fifty percent of patients received blood transfusion minimum of 2 units of blood. Febrile illness was seen among 23(14.4%), wound infection 17(10%), admission to intensive care unit 14(8.8%) and aspiration pneumonia in 9(5.6%) patients. There were five maternal deaths (3.1%). A total of 15 babies died giving an incidence of perinatal mortality of 0.94%.

Conclusion: This study concluded that previous uterine scar in the commonest cause of uterine rupture, followed by neglected prolonged labour in unscarred uteri. This catastrophic complication can be prevented by proper antenatal care counselling and clear documentation for hospital delivery for any high-risk pregnancy.

Keywords: uterine rupture, risk factors, maternal and fetal outcome

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Abbreviations: TOLAC, trial of labour after caesarean section; CS, caesarean section

Introduction

Uterine rupture is a serious emergency in obstetrics. It is a life-threatening situation for the patient but also a factor for many medicolegal cases for practicing physicians.¹ Uterine rupture contributes significantly to both fetal and maternal mortality and morbidities. There is wide variation in incidence between developed and developing countries.² In developing countries, the incidence is high due to socio economic factors, cultural practices and lack of access to antenatal and intra-partum care.³ In addition; prolonged and obstructed labour are the leading cause of uterine rupture.⁴ In developed countries; a scarred uterus and oxytocic stimulation of labour are the major causes of uterine rupture.⁵ The risk factors of uterine rupture are advanced maternal age, post date pregnancy, macrosomia, trial of labour after caesarean section (TOLAC), uterine scar from caesarean section (CS) and myomectomies, single-layer uterine closure, instrumental deliveries, fetal malposition, malpresentation and injudicious use of oxytocin.⁶⁻⁸ The major morbidities include haemorrhage, disseminated intravascular coagulation, renal failure, prolonged anaesthesia, delayed recovery, post partum wound infections, sepsis, anaemia and postpartum psychosis especially after caesarean hysterectomies, vesico-vaginal fistula, bladder rupture, and maternal death.^{9,10}

Fortunately, it is a preventable catastrophe. Early recognition and active management would result in better maternal and fetal outcome. Prevention starts at recognition of risk factors in antenatal, intrapartum risk factors and making a clear documentation along with referral to a safe birthplace.

The aim of this study is to find out the frequency of uterine rupture, analyse the predisposing factors and maternal and fetal outcomes.

Material and methods

It is a retrospective cohort study conducted at Lady Willingdon Hospital in Lahore for a period of 14 years from Jan 2004 to December 2017. The total number of deliveries at the centre was 17000. All cases of uterine rupture either received as emergency or detected during their hospital admission were included in this study. Diagnosis of uterine rupture was made based on history and clinical examination and confirmed by laparotomy. The clinical sign noted: signs of shock, severe abdominal pain, cessation of uterine contractions, palpable fetal parts in the abdomen and irregular or absent fetal heart sounds. Other signs like bleeding per vagina and fetal loss-of-station were also noted. All patients with suspected diagnosis had an intravenous line inserted immediately and blood grouping and crossmatching carried out for blood transfusion. Consent for immediate surgical intervention was obtained as well. The surgical intervention included preservation of the uterus (with or without bilateral tubal ligation) or either total

or subtotal hysterectomy. The surgical procedure depended mainly on the general condition of the patient, her parity, desire for future childbearing and the site and extent of the uterine rupture.

After approval by institutional ethical review committee. All cases of uterine rupture irrespective of the parity were included and data was collected by reviewing their records. Data collected included patient's age, parity, previous caesarean scar, myomectomy scar, medical and surgical history, induction of labour by prostaglandins, use of oxytocin for augmentation of labour, instrumental deliveries, macrosomia and booking status. Data was entered and analyzed using Excel; frequency distribution for categorical variables and descriptive statistics for continuous variables were computed.

Results

There were 160 cases of uterine ruptures recorded out of 17000 total deliveries with an overall incidence of 0.9%. Table 1 showed age distribution among patient with uterine rupture, it showed that the highest number of uterine ruptures occurred in women above 35 years. Table 2 showed the parity distribution among the patient; one third of the patient were grand-multigravida. The highest number of uterine ruptures occurred in women para 5 and above 53(33.1%). Almost tow third of patients were booked to antenatal care, while one third were unbooked to antenatal care. Table 3 showed the medical and surgical conditions among the patients of uterine rupture; seventy percent of patient had a uterine scar from myomectomy and CS. Twenty three percent of patients had diabetes mellites (DM) and gestational diabetes. Table 4 showed the causes of uterine rupture; seventy percent of patients had previous uterine scar from myomectomy or CS. Obstructed labour was found among 14(8.8%) patients and precipitate labour among 12(7.5%) patients. Table 5 showed maternal outcome. There were 15 cases of unrepairable rupture and underwent total or subtotal hysterectomy. One hundred forty-five uterine ruptures were repairable, the commonest site of rupture was transverse at the site of previous cs scar 92(63.4%), grand-multigravida with transverse rupture and those with fundal rupture had repair and bilateral tubal ligation 12(8.3%) and 19(13.1) respectively. There were 6 cases of bladder injuries detected during hysterectomy, subtotal hysterectomy was performed to five of them and repair done by the help of urologist. Two ureteric injuries suspected intraoperatively, and stenting done by urologist. Fifty percent of patients received blood transfusion minimum of 2 units of blood. Febrile illness was seen among 23(14.4%), wound infection 17(10%), admission to intensive care unit 14(8.8%) and aspiration pneumonia in 9(5.6%) patients. There were five maternal deaths (3.1%) due to irreversible shock and disseminated intravascular coagulation (DIC). A total of 15 babies died secondary to severe birth asphyxia giving an incidence of perinatal mortality of 0.94% (Table 6).

Table 1 Age distribution

Age (years)	No	%
20-24	9	5.6
25-29	42	26.3
30-34	48	30
35-39	36	22.5
> 40	25	15.6

Table 2 Parity distribution and booking status

Parity and booking status	No.	%
P0	3	1.9
P1	22	13.8
P2	15	9.4
P3	29	18.1
P4	38	23.8
>P5	53	33.1
Booked to antenatal care	49	30.6
Unbooked to antenatal care	111	69.4

Table 3 Medical and surgical history

Medical and surgical problem	No.	%
Diabetes Mellites	32	20
Gestational Diabetes	29	18.1
Chronic Hypertension	23	14.3
Hyperthyroidism	12	7.5
Hypothyroidism	19	11.8
Pregnancy Induced Hypertension	5	3.1
Myomectomy	31	19.4
Caesarean section (CS)	82	51.3

Table 4 Causes of uterine rupture

Cause	No.	%
Previous scar (myomectomy or CS)	113	70.6
Augmentation of labour with oxytocin	6	3.8
Obstructed labour	14	8.8
Abnormal lie	4	2.5
Precipitate labour	12	7.5
Induction of labour with PGE2*	6	3.8
Macrosomia	3	1.9
Twins pregnancy	2	1.3

*Prostaglandin E2

Table 5 Maternal outcome

Procedure & complications	No.	%
TAH*	10	6.3
Subtotal AH®	5	3.1
Repairable uterine rupture	145	90.6
-Transverse rupture	92	63.4
-Transverse rupture with BTL°	12	8.3
-Fundal rupture with BTL	19	13.1
-Lateral rupture	22	15.2
Bladder injury	6	3.8

Table Continued...

Procedure & complications	N0.	%
Ureteric injury	2	1.3
Maternal Morbidity		
-Febrile illness	23	14.4
-Wound infection	17	10.6
-Admission to ICU	14	8.8
-Blood transfusion	81	50.6
-Aspiration pneumonia	9	5.6
Maternal Death	5	3.1

*Total Abdominal Hysterectomy, @Abdominal Hysterectomy, °Bilateral Tubal Ligation

Table 6 Fetal and neonatal outcome

Outcome	N0.	%
Live birth	145	90.6
Still birth and neonatal death	15	9.4
Still birth	6	3.8
Neonatal death	9	5.6
Neonatal mortality rate	0.94	

Discussion

Ruptured uterus remains one of the serious obstetrics complications in developing countries. The occurrence of ruptured uterus varies in different parts of the world. In the developed world the frequency has dropped in recent decades due to improvement in antenatal care services. The incidence of uterine rupture in our study is 0.9%, this is due to increase in number of referrals from rural areas and the mismanagement of high-risk patients at the time of labour by unexperienced local midwives. Similar incidence has been reported, (0.9%) in Nepal (0.8%) in Ghana and the highest was in Ethiopia (2.8%).¹¹⁻¹³ However, the incidence in developed countries is around 1.9 per 10,000 pregnancies.^{14,15}

In this study, the incidence is high due to socio economic factors, cultural practices like home deliveries and lack to access to antenatal and intra-partum care due to difficult transportation from remote area, often originating from rural areas with poor antenatal care.

Maternal age has been studied as a risk factor for uterine rupture, in the current study 23% of mothers were above 35 years of age. Women older than 30 years old had 2- 3 times the risk of uterine rupture compared with women younger than 30.^{16,17} In addition, multiparity is common in Pakistan, it was another risk factor noted in our study. Thirty three percent of women were grand-multigravida, Malik found that (42.71%) uterine rupture occurred in women para 2-4.¹⁸ Many have considered multiparity as a risk factor for uterine rupture, Mukasa et al. found that women parity ≥ 5 were four times likely to get uterine rupture.¹⁹

Among the commonest medical problem in the study was DM and gestational diabetes in addition to poor antenatal care this can lead poor control of diabetes and consequently to macrosomia. This was the cause of uterine rupture secondary to obstructed labour as being noted in several cases.

In developed countries, uterine rupture most commonly occurs in uterus scarred by previous (CS) or myomectomy, mainly at term and during labour, and is even more frequent when labour is induced or augmented. In the current study, the commonest cause of uterine rupture was previous uterine scar from CS (51.3%) and previous myomectomy (19.4%). TOLAC with careful supervision had led that most of those ruptures were diagnosed early and intervention done immediately without delay, this resulted in good maternal and fetal outcome. This has been confirmed by several studies.^{14,15,20}

The second common cause of uterine rupture in this study was obstructed labour (8.8%) and precipitate labour (7.5%). Although preventable, obstructed labour has continued because of the high rates of unbooked pregnancies and the preference by the majority of unbooked patients to undergo labour outside of the hospital. In areas where home delivery is common, uterine rupture and maternal mortality is high as in some part in Africa, uterine rupture with or without obstructed labor is the leading cause of maternal mortality accounting for 36% of the total maternal mortality.²¹ A similar finding from a study in Yemen included 110 cases of uterine ruptures, obstructed labour 59 (53.6%) was the commonest cause of rupture.²² A major factor in uterine rupture in developing countries is obstructed labour due to inadequate access to medical care.^{23,24}

From a population-based study in Sweden reported that women with previous CS scar who experienced a spontaneous onset of delivery when compared to women whose second delivery was induced faced a doubled increase in risk of uterine rupture. In addition, induction of labor was associated with a doubled risk of uterine rupture both among women with a previous caesarean and among women who did not have previous caesarean. The rate of uterine rupture among women who attempted vaginal birth after a CS was 9/1000 compare with a uterine rupture rate of 0.18/1000 among women without a history of CS, also they concluded that high maternal age, induction of labour, and high birth weight increased the risk of uterine rupture.²⁵ In the current study 6 patients (3.8%) were induced with PGE2 and another 6 patients (3.8%) were augmented with oxytocin, all were previous CS had uterine rupture which was detected intrapartum and quick intervention done with good maternal and neonatal outcome.

Several studies showed that higher risk of severe maternal and neonatal outcome when a rupture occurs in a uterus without previous CS, than among women with previous CS.^{14,20,26} This could be explained by delay in diagnosis because of a lower suspicion of uterine rupture in an unscarred uterus and by the higher risk of massive haemorrhage in the more vascular, unscarred myometrium compared with in uterine scar tissue.²⁷ The survival of patients after uterine rupture depends on the time interval between rupture and intervention, and the availability of blood products for transfusion.²⁸ In the current study five maternal deaths (3.1%) were of unscarred uteri, secondary to obstructed neglected labour, were referred from rural area. This result is similar to a study by Bujold et al. were maternal mortality was 4.2%.²⁹

Most of the uterine rupture (90.6%) was repairable and the commonest site was transverse at the site of previous CS scar, this is similar result to other studies in the literature.^{24,27,30} Surgical decision in case of uterine rupture is influenced by factors such as the patient's age, parity, her desire for more children and the intraoperative assessment of the rupture. Six (3.8%) cases of bladder injuries were detected during hysterectomy and tow (1.3%) cases of ureteric

injuries as well detected and stenting done. Blood availability for transfusion as part of management of uterine rupture is lifesaving. In this regard 50.6% of patients had blood transfusion at a minimum of 2 packed red blood cell units. Early diagnosis and management of uterine rupture, widely available blood products as well as careful and close monitoring post operatively is an important factor to decrease morbidity and mortality. So, the higher incidence of uterine rupture in our study is due to previous uterine scar like in developed countries. Several studies have indicated that lower socioeconomic status and lack of education are associated with poor health seeking behaviour and access to care, hence resulting into high proportions of lack of skilled attendance at birth, prolonged labour and uterine rupture in unscarred uteri.^{31,32}

Unfortunately, perinatal outcome was triple the maternal loss in this study, due severe birth asphyxia associated with rupture uterus. The majority were referral from rural area. Perinatal mortality was 0.93% which is comparable with other studies from developing countries.^{18,33}

Conclusion

Uterine rupture is associated with severe maternal and fetal morbidity and mortality. This study concluded that previous uterine scar in the commonest cause of uterine rupture, followed by neglected prolonged labour in unscarred uteri. This catastrophic complication can be prevented by proper antenatal care counselling and careful follow up of guidelines for TOLAC. Clear documentation for hospital delivery for any high-risk pregnancy during antenatal care. In addition; training of midwives in rural area for referral to tertiary hospital with quick and equipped transportation with well trained health providers.

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Conflicts of interest

The author and co-authors have no conflicts of interest relevant to this article.

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