The Evaluation of Uterine Rupture in 61 Turkish Pregnant Women

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ABSTRACT

Aim: *The aim of our study, to evaluate the patients with complete or incomplete uterine rupture which occurred during pregnancy retrospectively and to analyze and present of the risk factors, maternal and perinatal outcomes, and complications.*

Method: *Sixty one patients diagnosed as uterine rupture were investigated retrospectively in our clinic between 1999 and 2009.*

Result: *The incidence of uterine rupture for our department in a ten year period was calculated as 0.12 %. Fifty four patients (88.5%) were in low socioeconomic status. Fifty one (83.6%) patients did not receive any antenatal care. Forty eight (78.6%) of the cases had previous ute rine surgery due to cesarean, myomectomy or metroplasty. Twenty six cases (42.6%) were grand multiparous. Primer repair of uterus was performed in 58 (95.1%) of the patients. Subtotal abdominal hyste rectomy was performed in three patients (4.9%). There were 15 fetal deaths while no maternal death was occurred.*

Conclusion: *Rupture of the pregnant uterus is a major obstetric comp lication that occurs often with no warning signs. Uterine rupture is a potential complication for patients with non-scarred uterus as well as scarred uterus. Grand multiparty is a very important risk factor, especially in patients without uterine scar. Despite to its low rate, uterine rupture is a very important complication for mother and fetus. Early diagnosis, immediate preoperative resuscitation, rapid replacement of blood loss, and urge surgical therapy are very important in treatment of uterine rupture. Hysterectomy is not the first choice in case of uterine rupture management.*

Key words: *Complete uterine rupture, incomplete uterine rupture, pregnant woman*

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61 Gebe Hastada Uterus Rüptürünün Değerlendirilmesi

Amaç: Çalışmamızın amacı, hamilelik sırasında komplet veya inkomplet uterin rüptür gelişen hastalardaki risk faktörleri, maternal ve perinatal sonuçları ve komplikasyonları retrospektif olarak incelemek.
Metod: 1999-2009 tarihleri arasında kliniğimizde tespit edilen, gebelikte görülen 61 uterus rüptürü olgusu retrospektif olarak incelendi.
Bulgular: Kliniğimizde uterin rüptürün insidansı 10 yıllık peryotta %0.12 olarak hesaplandı. 54 (%88.5) hasta düşük sosyoekonomik durumdaydı. 51 (%83.6) hasta hiç antenatal bakım almamıştı. 48 (%78.6) hasta daha önceden sezaryen, myomektomi veya metroplasti operasyonu olmuştu. 26 (%42.6) hasta grandmultipardı. Hastaların 58 (%95.1)'ine primer tamir yapıldı. Üç (%4.9) hastaya subtotal histerektomi yapıldı. 15 fetal ölüm olurken hiç maternal ölüm olmadı.
Sonuç: Gebe uterusunun rüptürü sıklıkla uyarı vermeden ortaya çıkan büyük bir obstetrik komplikasyondur. Uterin rüptür skarlı uterusa sahip hastalarda olduğu gibi skarsız uterusa sahip hastalarda da görülebilen bir komplikasyondur. Grandmultiparite özellikle skarsız uterusa sahip hastalarda çok önemli bir risk faktörüdür. Düşük oranlarına rağmen uterin rüptür, anne ve fetüs için çok önemli bir komplikasyondur. Uterin rüptürün tedavisinde erken teşhis, hemen preoperatif resusitasyon, kaybolan kanın hızlı replasmanı ve acil cerrahi tedavi çok önemlidir. Histerektomi, uterin rüptür vakalarının yönetiminde ilk seçenek değildir.
Anahtar kelimeler: Tam uterus rüptürü, tam olmayan uterus rüptürü, gebe kadın

INTRODUCTION

Rupture of the gravid uterus is associated with high maternal and perinatal mortality-morbidity and loss of future fertility. Despite advances in modern obstetric practice, rupture of gravid uterus still remains as a fetal and maternal life threatening complication especially in developing countries. The incidence of uterine rupture is reported in 0.05% of all pregnancies (1, 2). Although some authors demonstrated that there is no significant difference in the outcome of labor between women with and those without previous cesarean section with regard to rupture of the uterus. Separation of a previous cesarean section scar is the most common predisposing factor of uterine rupture (3-5). Other common predisposing factors are low socioeconomic status, lack of antenatal care, grand multiparity, induced and prolonged labor (6, 7).

Herein we assessed the potential predisposing factors of uterine rupture such as socioeconomic status, lack of antenatal care, previous uterine surgery, grand multiparity, induced and prolonged labor with the aim of giving an insight to the obstetrician about the complications of incomplete or complete uterine rupture.

MATERIALS AND METHODS

Between 1999 and 2009, the clinical records of 19261 pregnant patients admitted to our clinic were retrospectively reviewed. The patients who were over 26 weeks of gestation and undergone surgery because of uterine rupture and the patients with incomplete uterine rupture diagnosed during cesarean section were enrolled into the study.

The data's of patients such as age, parity, weeks of gestation, socioeconomic status, whether having an antenatal care or not, prior uterine surgery, other predisposing factors, surgical findings, type of operation, birth weight, maternal and fetal mortality and morbidity were recorded as retrospectively. Low socioeconomic status was defined as annual income of 2000 dollars. Grand multiparty was defined as 5 or more parities. Macrosomic fetus was defined as 4500 gr or more. Uterine rupture typically is classified as either: 1) Complete uterine rupture was defined as complete when all layers of the uterine wall are separated, with or without expulsion of the fetus or 2) Incomplete uterine rupture was defined as incomplete when the uterine muscle is separated but the visceral peritoneum is intact (8).The results of the patients developed complete and incomplete rupture were compared.

The data were analyzed using SPSS 13.0 for Windows (SPSS Inc., Chicago, IL, USA). All values are expressed as mean ± standard error of the mean. The distribution of values, whether normally distributed or not, was determined with the Kolmogorov-Smirnov test. Age, gestational age, parity, blood transfusions and hospitalization duration were compared by Student's t-test Grand multiparity and previous cesarean section rates among the groups were compared by chi-square test. p value <0.05 was considered statistically significant.

RESULTS

In the period of study a total of 19261 deliveries were occurred at our department. And among of these patients, a total of 61 cases with uterine rupture of pregnant uterus were observed. 37 of these patients were referred to our clinic with the suspicion of uterine rupture. The other 24 patients were under our control during whole pregnancy period. Therefore the exact incidence of uterine rupture for our department in a teen year period was calculated as 0.12 %. The uterine rupture was classified as complete in 21 (34%) patients and incomplete in 40 (66%) patients according to the surgical findings. The mean age of patients were 30.2±3.6 years and the mean gestational ages were 37.7±2.9 weeks. Fifty four patients (88.5%) were in low socioeconomic status. Fifty one (83.6%) patients did not receive any antenatal care. Forty eight (78.6%) of the cases had previous uterine surgery due to cesarean, myomectomy or metroplasty. Twenty six cases (42.6%) were grand multiparous. The rate of grand multiparity (88.46%) was higher in the group of patients with incomplete uterine rupture. Other observed predisposing factors were induced labor (16.4%), prolonged labor in 8 (13.1%), macrosomic fetus (9.8%), fundal pressure (8.2%), multiple pregnancies (3.27%) and hydrocephaly (1.64%), respectively. We did not detect any predisposing factor in two cases (Table 1).

***Table 1**. The demographic features of patients with uterine rupture.*

Age (years) (mean±SD)(min-max)	*30.22±3.66 (20-38)*
Parity (mean±SD)(min-max)	*3.34±1.96 (2-9)*
Mean gestational age (weeks) (mean±SD)(min-max)	*37.7±2.94 (26-42)*
Mean birth weight (g) (mean±SD)(min-max)	*3351.80±748.21 (1600-5100)*
Low socioeconomic class (n,%)	*54 (88.52%)*
No antenatal care (n,%)	*51 (83.60%)*
Previous uterine surgery (n,%)	*48 (78.68%)*
Previous cesarean section (n,%)	*34 (55.74%)*
Two or more previous cesarean section (n,%)	*14 (22.95%)*
Other uterine surgery (n,%)	*4 (6.56%)*
Grand Multiparity (≥5) (n,%)	*26 (42.62%)*
Malpresentation (n,%)	*10 (16.39%)*
Oxytocin-induced labour (n,%)	*8 (13.11%)*
Prostaglandin-induced labour (n,%)	*2 (3.28%)*
Prolonged labor (n,%)	*8 (13.11%)*
Macrosomic fetus (n,%)	*6 (9.83%)*
Fundal pressure (n,%)	*5 (8.20%)*
Multiple pregnancy (n,%)	*2 (3.27%)*
Hydrocephaly (n,%)	*1 (1.64%)*
No (n,%)	*2 (3.27%)*

Table 2 shows fetal and neonatal outcomes of patients with uterine rupture. Blood transfusion was necessitated in twenty six patients (42.6%). During surgery bladder injury was occurred in four patients (6.56%). Subtotal abdominal hysterectomy was performed in 3 patients (4.9%). Total hysterectomy was not performed in any patient. Primary repair of uterus was performed in 58 (95.1%) of the patients. There were 15 fetal deaths while no maternal death was occurred. Demographic features, significant predisposing factors, maternal and fetal outcomes were compared in Table 3. The demographic features, mean hospitalization time, mean number of units of blood transfused were similar between complete and incomplete uterine rupture. Grand multiparty, prior cesarean section, subtotal hysterectomy and fetal death were higher in the complete uterine rupture. All fetal deaths were occurred in patient with complete uterine rupture.

***Table 2**. Fetal and neonatal outcomes.*

Blood transfusions (n,%)	*26 (42.62%)*
Bladder injury (n,%)	*4 (6.56%)*
Ureter ligation (n,%)	*1 (1.64%)*
Hospitalization days (≥5) (n,%)	*20 (32.79%)*
Primer repair (n,%)	*58 (95.08%)*
Subtotal hysterectomy (n,%)	*3 (4.92%)*
Fetal death (n,%)	*15 (24.59%)*
Maternal death (n)	*0*

The incomplete rupture was occurred at the side of prior cesarean section scar in all patients. The site of

Table 3. Demographic features and clinical comparison of complete and incomplete uterine ruptures.

	Complete	Incomplete	p
Number (n,%)	21 (34.43%)	40 (65.57%)	
Age (year)	29.76±6.16	30.48±7.08	ns
Parity (n)	4.71±2.43	4.15±1.67	ns
Gestational age (weeks)	38.32±6.24	37.48±4.47	ns
Grand multiparity (≥5) (n,%)	18 (85.71%)	8 (20%)	p<0.05
Previous cesarean section (n,%)	9 (42.86%)	38 (95%)	p<0.05
Blood transfusions (Ü)	2.48	0.42	ns
Hospitalization duration (day)	5.62±2.76	3.3±1.65	ns
Subtotal hysterectomy (n,%)	3 (14.26%)	0	
Maternal death (n)	0	0	
Fetal death (n,%)	15 (71.43%)	0	

ns: non-significant

complete rupture was at the prior cesarean section scar, fundal or lateral, lower segment, and a combination in 5 (23.81%), 6 (28.57%), 3 (14.29%), and 7 (33.33%) cases, respectively.

DISCUSSION

Rupture of the gravid uterus is an unexpected obstetric emergency with a high maternal and perinatal morbidity-mortality. The incidence of uterine rupture varies among countries. The highest incidence reported in the literature is 1 of 93 deliveries (1.07%) (9). In another study the incidence of uterine rupture is reported 1 of 9908 deliveries by Roungsipragarn et. al (0.010%) (10). According to the hospital based studies World Health Organization reported that the incidence was 0.31% (11). In our study incidence of uterine rupture was 0.12% (1 of 802 deliveries). Although this rate is similar with a study reported from Turkey (0.13%) (7), there is another study with lower incidence rate (0.015%) reported from developed cities of our country in the literature (12). As seen in the literature there are studies reporting different rates of uterine rupture from the same countries. This depends on the many factors such as socioeconomic status, educational level of people living in the same region.

The incidence of uterine rupture tends to be lower in developed countries. The high incidence in developing countries has been attributed to several factors such as low socioeconomic status, no antenatal care, difficulties of transportation, low education level, grand multiparity, trauma and inadequate health facilities (13). In developed countries most important predisposing factors are prior surgical procedures such as cesarean section, myomectomy, perforation, corneal resection and hysteroscopic procedure (13). In our study, the most common predisposing factors were low socioeconomic status, no antenatal care, prior uterine surgery and grand multiparty, respectively. Demographic features were similar in complete rupture and incomplete rupture. Similar findings were noted in prior studies in developing countries (7, 15). Various studies have shown that prior uterine surgery is the major predisposing factor for uterine rupture (16, 17). In our study, the most common predisposing factors were grand multiparty for complete rupture and previous cesarean section for incomplete rupture. Traditionally, the risk of uterine rupture is actually 5 times higher in the case of women with 2 previous cesareans compared to those with only a single previous cesarean (18). None of the patients were primigravidas.

Rupture of non-scarred uterus is an extremely rare entity. In our study, 13 of the 61 (21.3%) uterine ruptures occurred in patients with non-scarred uterus. In the American College of Obstetricians and Gynecologist reported that rupture of non-scarred uterus may occur in such situations; obstructed labor, multiple gestations, abnormal fatal lie, and notably in women of grand multiparty (19). Chuni N et al noticed that the grand multiparty is the most common (46.5%) predisposing factor for uterine rupture in the women with non-scarred uterus (22). Similarly in our study, the grand multiparty was found to be the major predisposing factor (69.2%) for non-scarred uterus.

Uterine rupture may lead to increase in fetal and maternal mortality rate. Flamm et al reported maternal

mortality rate as 4.2% and perinatal mortality rate as 45% (19) in their study. Saglamtas et al reported that fetal mortality rate was 32.5 % in their study including 40 cases (21). Chuni reported that maternal mortality rate was 13.5% (22). In our study perinatal mortality was 24.59%. And all perinatal mortality cases occurred after complete rupture. We think that high perinatal mortality rate after complete uterine rupture 71.4% is associated with delayed transport of patient to the hospital. Maternal mortality rates in our study were similar with the studies of Saglamtas and Ofir (21, 23). Maternal-fetal morbidity and mortality rate may be diminished remarkably with awareness, prompt diagnosis, rapid replacement of blood loss and improved techniques in surgical management and neonatal care (12).

The reason of poor prognosis (increased blood transfusion requirement, prolonged hospital stay, need for hysterectomy, increased perinatal mortality rates) in patients with complete rupture may be attributed to high incidence of grandmultiparity 85% and the labor outside the hospital. The incomplete uterine rupture generally occur secondary to previous surgery (95%). And these patients perform the following labor in the hospital and good conditions. So the prognosis of patients with incomplete rupture is better. In the Nepal's study, the uterine wall is generally ruptured in the lateral and anterior wall (scar region) in non-scarred and scarred uterus, respectively (22). In our study in all patients with incomplete uterine rupture, the rupture region was scarred region (anterior wall). But the complete uterine rupture was multi-focal. Prior cesarean section scar, fundal or lateral, lower segment, and a combination were the sites of rupture in 5 (23.81%), 6 (28.57%), 3 (14.29%), and 7 (33.33%) cases, respectively.

The surgical technique depends on the type and localization of rupture, the clinic of the patient and the desire of the fertility. Different hysterectomy (total or subtotal) rates are reported in the literature in the range of 42.4-70.6% (7,12).Contrast of all these studies, we performed primary repair in most cases (95.08%). We performed hysterectomy in only three cases. We believe that most uterine rupture cases can be treated with primary repair. However the patients who undergone primary uterine ruptures repair should be informed about the high risk of uterine rupture in the following gravidities. To prevent the risk of uterine rupture, the elective caesarean section is recommended before the labor (24).

In conclusion, rupture of the pregnant uterus is a major obstetric complication that occurs often with no warning signs. Uterine rupture is a potential complication for patients with non-scarred uterus as well as scarred uterus. Grand multiparty is a very important risk factor, especially in patients without uterine scar. Despite to its low rate, uterine rupture is a very important complication for mother and fetus. Early diagnosis, immediate preoperative resuscitation, rapid replacement of blood loss, and urge surgical therapy are very important in treatment of uterine rupture. Hysterectomy is not the first choice in case of uterine rupture management.

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