



## ORIGINAL RESEARCH PAPER

## Obstetrics &amp; Gynecology

## ANALYZING THE RISK FACTORS, MATERNAL AND FETAL OUTCOME OF UTERINE RUPTURE IN PREGNANCY

**KEY WORDS:** uterine rupture, scarred uterus, unscarred uterus, mortality.

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## ABSTRACT

**Aim :** To find the incidence, etiological factors and fetal and maternal outcome of uterine rupture in King George Hospital Visakhapatnam

**Materials and methods:** A study of uterine rupture in third trimester or in term pregnancy during the period of two years in our hospital. Criteria: pregnant women both primi or multigravida with or without scar of Ceasarean operation, myomectomy, Hysterotomy, uterine anomaly. Exclusive criteria : Pregnancy with medical diseases.

**Results:** Out of 12,943 admissions in Labor ward, 43 cases of uterine rupture were seen. 26 cases were multiparous with obstructed labour, 1 was multiparous without obstructed labour. 11 cases were with scar rupture, 1 with bicornuate uterus and 1 with rudimentary horn, 1 with instrumentation, 2 were malpresentation. Symptoms: 5 patients with mild to moderate bleeding per vaginum, 19 patients with hypotension and tachycardia, haematuria in 4 patients, 4 patients presented with none of the symptoms (silent).

Management with fluid resuscitation and blood transfusion, laparotomy done. Out of 43 patients the rent repair was done in 8 patients, Subtotal hysterectomy in 15 patients, Total hysterectomy was done in for 18 patients. 3-8 units of blood transfusion were required for all either in intra operative or in post operative period. And also broad spectrum antibiotics were given along with critical care. The patients with rent repair recovered well and discharged on 7<sup>th</sup> POD. One patient was complicated by sepsis and she was discharged on 23<sup>rd</sup> POD. Patients of subtotal hysterectomy were discharged between 8<sup>th</sup> to 15<sup>th</sup> POD. Nine patients died on immediate to 3<sup>rd</sup> POD.

Fetal outcome: 29 patients had fetal demise, 5 babies born with low APGAR 2 – 4, 3 babies were born with prematurity.

To conclude all patients were unbooked and referred from remote tribal areas. The highest incidence of mortality associated with multiparity with obstructed labor. Next frequent cause was post caesarean pregnancy. The cause could be the delay in transporting the patient to tertiary care centre. And also unidentifying the high risk pregnancy such as post caesarean pregnancy

## INTRODUCTION

Uterine rupture during pregnancy is rare and more dangerous complication with high incidence of maternal and fetal morbidity as well as mortality. The rate of uterine rupture is less than 1%. But in developing countries it is slightly more.

The signs and symptoms are nonspecific initially, so that it is difficult to make the diagnosis and often delays the treatment. The symptoms and signs are inconsistent.

Uterine rupture is defined as disruption of full thickness of uterine wall along with the visceral peritoneum. It is associated with clinically significant uterine bleeding, fetal distress, protrusion or expulsion of fetus and placenta into the abdominal cavity. In scar dehiscence the disruption and separation of preexisting uterine scar. Uterine scar dehiscence is more common than uterine rupture.

## Incidence

As per the meta analysis of the pooled data from 25 studies in peer reviewed literature published from 1976 – 2012 showed the incidence of pregnancy related uterine rupture is 0.07%. The spontaneous rupture during pregnancy without previous scar is 0.012% in developed countries.

In developing countries the incidence of uterine rupture during pregnancy is 0.07%. The risk factors for uterine rupture are Previous uterine scar, which may be previous caesarean scar, Myomectomy scar, hysterotomy scar or previous ruptured scar repair. In pregnancy with previous myomectomy scar the rupture occurs in third trimester. Dubuisson et al reported 100 patients who underwent laparoscopic myomectomy, found 3 uterine rupture during subsequent pregnancies. (1) Multiparity is most common high risk factor for uterine rupture in unscarred uterus. More than 50% of the cases of uterine rupture occurred in multiparity between 3 to 5. Golan et al reported 19 (31%) of 61 cases (2). Schinsky and Benson found that 7 out of 22 cases with parity of more than 4 Uterine instrumentation, uterine trauma, multifetal gestation (3) macrosomia (4) Polyhydramnios, post dated pregnancy, hydatid mole, choriocarcinoma, contracted pelvis, cephalo pelvic disproportion, intra uterine manipulations

like external cephalic version, internal podalic version, breech extraction, shoulder dystocia, manual extraction of placenta, induction of labour, fundal pressure, Obstructed labour, neglected labour. Congenital uterine anomalies like pregnancy in rudimentary horn, As in a study Nahum reported that uterine anomalies affect 1 in 200 pregnancies (5). The walls of abnormal uteri abnormally thin as pregnancy advances. The thickness varies in different sites of myometrium (6,7,8,9). Usually these ruptures occur before third trimester. The risk increases particularly with induction of labour in anomalous uterus (10). cornual pregnancy.

Rupture of previous caesarean scar depends on the strength of scar, type of uterine incision, Two or more previous caesarean sections increases the risk of uterine rupture by 2 to 16 fold in comparison with single previous caesarean delivery. (11)

Single layer uterine closure has got 3.1% of uterine rupture versus 0.5% of rupture with two layer closure (12)

the inter delivery interval between to caesarean sections. If the interval is less than 18 months, the risk of rupture increases. The risk is also increased in pregnancy with previous caesarean scar with trial of labour and induction of labour. In a meta analysis, Mozurkewich and Hutton used pooled data and showed that the rate of uterine rupture in trial of labour on previous caesarean section is 0.39%, when compared with patients underwent for repeat elective caesarean operation with 0.16% of rupture uterus. (12). Hibbard et al reported the risk of uterine rupture in 1,324 women with trial of labour. In 366 women with previous caesarean section with induction of labour with prostaglandins, the scar rupture was 2.45% in comparison with 0.77% without prostaglandins (13).

## The symptoms and signs of uterine rupture:

The rupture occur with previous caesarean scar is less dangerous than spontaneous or traumatic rupture occur in unscarred uterus due to less vascularity. And also the symptoms depend upon the timing, site and extent of defect. The classical signs and symptoms of uterine rupture are (1) fetal distress with prolonged, late or recurrent variable decelerations or fetal bradycardia are often the first sign of uterine rupture (2) decreased baseline pressure in

uterus (3) loss of uterine contractility (4) abdominal pain (5) recession of presenting fetal part (6) bleeding and (7) shock. However all these symptoms may or may not present.

**Diagnosis**

Sophisticated diagnostic methods are limited in use. Clinical diagnosis is more important and prompt surgical treatment. Several studies have shown that fetus should be delivered within 10-37 minutes of uterine rupture to prevent fetal morbidity and mortality.(14,15,16,17,18) . The treatment includes fluid resuscitation, blood transfusion and immediate surgical intervention.

The consequences of uterine rupture are divided into 2 major categories. Fetal consequences include (1) hypoxia, (2) low APGAR score (3) Admission into neonatal intensive care unit (4) perinatal death. Maternal consequences include (1) severe blood loss requires blood transfusion (2) Cystotomy (3) need for hysterectomy (4) death Leung et al found 5 of 99 neonates born to women with uterine rupture developed asphyxia. In a study by Menihan, 6 of 11 (55%) fetuses born to women with uterine rupture had bradycardia prior to delivery. Menihan found that 8 out of 11 (73%) (17) newborns required NICU admission. In other two more studies by Kieser and Baskett (19) and Landon et al NICU admission rate of 45% (8 of 18 and 46 of 144) (20) Fetal mortality rate associated with uterine rupture is very high.

Maternal consequences of uterine rupture Severe maternal blood loss causing anemia in patients with uterine rupture mean blood loss is 1500 ml. In Leung et al found that 29% of the patients required blood transfusion(21) In a study by Shipp et al 25% (7 of 28) of women with uterine rupture and in Kieser and Baskett study 44% (8 of 18) of patients with rupture required blood transfusion. 29% (in 99 patients) of the patients presented with hypovolemic shock with uterine rupture in Golan et al study. Maternal bladder injury was noted in 8% (7 of 91) of the patients with uterine rupture. In a study by Shipp et al 18% (5 of 28) of the women presented with bladder injury. Kleiser Baskett study 17%, Leunge et al 12% Surgical treatment includes rent repair or hysterectomy either subtotal or total hysterectomy depending on the site and extent of the rupture. The type of the surgical repair depends on the site, extent of the rupture, amount of blood loss and condition of the patient. Bleeding is significantly high in vertical rupture. Conservative surgery is indicated for women with low transverse uterine rupture, rupture not extending into broad ligament, cervix or vagina, easily controlled bleeding, good general condition, women wants to conceive, no evidence of coagulopathy. Conservative surgery includes rent repair. Hysterectomy is considered if the bleeding is uncontrolled, extended rupture, multiple and vertical tears.

Maternal outcome is good with quick intervention, prompt hypovolemic correction with blood transfusion. In developed countries mortality is less. Fetal outcome depends on the duration between fetal distress due to rupture and caesarean delivery. The ideal time duration for good fetal outcome should be less than 37 minutes.

**RESULTS OF PRESENT STUDY**

This study was conducted was conducted for the period of two years in King George Hospital, Visakhapatnam from June 2014 to May 2016. In this study, the women admitted in to the labor ward in third for delivery were 12,943. Among all these admissions 44 cases of uterine rupture were presented. In these cases, some were diagnosed before proceeding for surgery and some were diagnosed at the time of operation. Among all these cases, incidence, risk factors, maternal and fetal outcome were analyzed. In present study the incidence of uterine rupture is nearly 0.3%. Almost all the cases were un booked. And they were referred from very remote places. Because our hospital is tertiary care centre cases from other districts also were referred. Among all the 44 cases, 26 (59%) cases of uterine rupture were due to obstructed labour in both primi gravida and multigravida without any previous scar on the uterus. 11(25%) cases of uterine rupture were associated with previous caesarean section and one (2.3%) case was associated with myomectomy scar. 2 (4.5%) cases with

congenital uterine abnormality, 2 (4.5%) with malpresentation, one (2.3%) case with grand multipara without any obstruction, one (2.3%) with instrumentation. The following table shows the incidence of uterine rupture with various etiological factors.

Incidence of uterine rupture	44/12943	0.3%
Obstructed labour	26/44	59%
Previous CS	11/44	25%
Myomectomy	1/44	2.3%
Cong uterine anomaly	2/44	4.5%
Malpresentation	2/44	4.5%
Multipara	1/44	2.3%
Instrumentation	1/44	2.3%

But many studies showed that the previous caesarean operation was the most common cause for uterine rupture. Their reports showed the obstructed labour was the second most common cause for uterine rupture. Next most common causes were uterine anomaly and malpresentations.

Most of patients were presented in the labor ward with features of hypovolemic shock. Pallor, tachycardia and hypotension were main features clinically and also Hematuria, bleeding and cessation of labor pains. The patients with obstructed labor were presented with more disastrous condition and patients with uterine rupture with previous CS were less dangerous.

Hypovolemic shock	17	39%
Cessation of labour pains	7	16%
Haematuria	5	11%
Vaginal bleeding	8	18%
Silent	7	16%

The uterine rupture in previous CS associated with good fetal heart rate and some with fetal distress. The rupture associated with obstructed labor presented with fetal demise.

Out of 44 patients with uterine rupture, 9 (20%) patients with uterine rupture presented with good fetal condition.15 (34%) patients were presented with fetal demise, NICU admissions 20 (50%). Among these NICU admissions 16 (36%) babies with low APGAR and 4(9%) with preterm as in rupture with uterine anomaly and with myomectomy scar. Among 20 NICU admissions, neonatal outcome was good in only 8 babies.

The patients presented with superficially palpable fetal parts, 7 (15%) of patients with uterine rupture presented with cessation of labor pains, 18 (40%) with receding fetal head, 15 (34%) with absent fetal heart. 15 (34%) patients with maternal hypovolemic shock, haematuria and 8 (18%) patients with vaginal bleeding 5 (11%) with haematuria The treatment includes resuscitation with blood transfusion and immediate laparotomy. All the patients with uterine ruptured required 2 to 5 units of blood transfusion. The patients of uterine rupture with previous uterine scar were presented with mild to moderate haemoperitonium. And the rupture is clear and clean with limited involvement. This rupture was sutured in two layers and haemostasis secured well. On the other hand the uterine rupture without previous scar presented with severe degree of haemoperitonium with shock. In this more number of sites of rupture in irregular directions.

Surgical treatment done for all the patients with uterine rupture. Out of 44 patients with uterine rupture, 7 (16%) patients were treated with rent repair only. 10 (23%) with uterine closure, 11(25%) with subtotal hysterectomy, 16 (36%) with total hysterectomy.

Maternal outcome of the patients who underwent rent repair and uterine closure was good. The post operative period was uneventful and they were discharged on 7<sup>th</sup> post operative day. 10(91%) patients who underwent subtotal hysterectomy were discharged on 7<sup>th</sup> post operative day. But one (9%) patient died on 7<sup>th</sup> post operative day due to sepsis. The mortality was high with the patients underwent total abdominal hysterectomy. 7 (43%) patients died in post operative period with various causes like hypovolemia and sepsis. Over all 44 cases of uterine rupture the mortality rate was 23%.

Fetal outcome : Of all patients of with rupture uterus 9 (20%)babies were born with good APGAR, not required NICU services. These babies are born to the patients with rupture of previous scar rupture. 15 (33%) patients were presented with fetal demise. 20 (45%) babies were born with low APGAR and required NICU admission. Among the NICU admissions, fetal outcome was good in only 8 (40%) babies.

To summarize, in my study high mortality is associated with uterine rupture in unscarred uterus with poor fetal outcome. The incidence of uterine rupture is more in multigravida with obstructed labor (neglected labor). In patients of uterine rupture with previous caesarean scar, the mortality is zero with good fetal outcome. The reason for the uterine rupture in multigravida is that there were no proper transport facilities from the remote areas. Once the obstructed labor is diagnosed, they have to travel around 4 to 5 hours to reach our hospital. By the time they reach the hospital, uterus gets rupture. In this study all the cases were un-booked only.

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