How to Cite:
richal, P., Gupta, R. V., Gangwar, P., & Dubey, P. (2022). Retrospective study on rupture uterus, its causes and maternal-fetal outcome. *International Journal of Health Sciences, 6*(S7), 2982–2991. https://doi.org/10.53730/ijhs.v6nS7.12306

Retrospective study on rupture uterus, its causes and maternal-fetal outcome

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***Abstract*---**Rupture uterus is a gravid complication which is commonly seen post uterine surgery in perinatal women leading to maternal morbidity and fetal death. Common causes are previous caeserian section, obstructed labour , malpresentations, multipara women etc. Patient presents with pain, uterine bleeding, fetal distress, and even death of fetus. We did a retrospective study in our institute in which we collected data of previous 4 years. Incidence of rupture was 0.2%. Most common risk factor was previous caeserian section and other uterine surgery. Unscarred uterus ruptured most commonly due to obstructed labour, other causes were malpresentation, multipara women and induction of labour. Majority of fetuses can not be saved due to late arrival to hospital. 49 patient required obstetric hysterectomy and rest 53 uterus repaired with or without ligation. Other complications were extension of rupture, bladder injury and hemoperitonium. We concluded that scarred uterus need to monitor closely at term and promt transportation and diagnosis can improve fetomaternal outcome.

***Keywords*---**maternal morbidity, obstetrician, complication which is commonly.

Introduction

Uterine rupture is tearing of all three layer of uterus that is endometrium, myometrium and perametrium. This is a catastrophic event which can occur during pregnancy, delivery or immediately after delivery. It affects both fetal and maternal outcome. Beyond this, as a result of hysterectomy patient suffers from permanant infertility [1]. Uterine rupture usually seen in gravid uterus rarely it has been seen in non-pregnant uterus because of trauma, infection, or cancer.[2] Uterine dehiscence is incomplete division of the uterus that does not involves all three layers. Uterine dehiscence can produce a uterine window—a thinning of the uterine wall that may allow the fetus to be seen through the myometrium. Often uterine dehiscence is an occult finding an asymptomatic patient.[3]

Even though uterine rupture is a rare event in developed countries, it is still one of the major public health problem in developing countries that endanger the life of many mothers [4].Maternal mortality is high in developing country like India. According to SRS 2016-2018 MMR was 113 per 100,000 birth, uterine rupture and obstructed labor one of the leading cause of it.

In developed countries prevalence rate of uterine rupture 0.006% which is very less than developing country according to WHO systematic review of maternal mortality and morbidity secondary to uterine rupture. Uterine rupture in developed countries mostly occurs secondary to prior cesarean section [1]

Due to a desire to offer more patients a trial of labor after cesarean delivery (TOLAC) incidence of uterine rupture has increased in recent years . The main considerations when counseling patients on TOLAC is risk of uterine rupture.[5] Successful vaginal delivery called as VBAC or vaginal birth after cesarean.

Globally, the incidence of uterine rupture is 0.07% which is much lower than what is in India. Use of uterotonics and trial of labor on a scarred uterus are main reasons for the occurrence of uterine rupture in developed countries [6–8]

However, in developing country causes can be divided in obstetric and non-obstetric such as; multi-gravidity, previous cesarean section scar,elderly primi, teen-age pregnancy, unsupervised labor, poor socio-economic status,and unwise use of uterotonic agents [9]. Studies done in developing countries like Nigeria and Uganda showed that the main reasons for uterine rupture were unwise use of oxytocin drug, obstructed labor, grand multi-parity and abnormal fetal presentation [10–12].

The number of cases of rupture uterus is rising due to changing trends of advanced maternal age at the time of conception, increasing caesarean sections rates, a higher rate of induction of labour by using prostaglandins and oxytocin and rising number of trans-myometrial infertility surgeries prior to conception. However, with enhancement in contemporary obstetric services, cases of uterine rupture following previously unscarred uterus are declining [15]

The myometrium can stretch beyond its optimal range in conditions like gestational diabetes with macrosomia, polyhydramnios, multiple gestation

pregnancy, and uterine anomalies such as fibroids .[13][14] These conditions are associated with a higher risk of uterine rupture. There is also evidence that serial stretching of the uterine wall, such as occurs in multiparous women, may increase the risk of rupture.[1]

Clinical features of Uterine rupture are paroxysmal pain, uterine bleeding, fetal distress, and even protrusion or expulsion of the fetus and/or placenta into the abdominal cavity [16].

Uterine rupture after caesarean scar rupture is diagnosed on the basis of altered fetal heart rate pattern, vaginal bleeding, maternal tachycardia or unusual pain during labour. Non-contrast MRI is being increasingly used in pregnant patients For rapid and accurate identification of the aetiology of abdominal pain, in the emergency setting [17].

The possible maternal complications of rupture uterus are severe haemorrhage, blood transfusion, hysterectomy, bladder injury, maternal death .The fetal complications are prematurity, low Apgar scores and death. The maternal outcome depends on promptness with which the patient is managed, availability of blood transfusion, competent surgical intervention and adequate anaesthesia .

The surgical intervention on the uterus depends on the type and extent of the rupture, hemodynamic status of the mother, desire for future fertility, presence of gross infection and experience level of the surgeon. The possible treatment option are total abdominal hysterectomy, subtotal abdominal hysterectomy and uterine repair with or without tubal ligation.

A low transverse rupture with no extension of the tears to broad ligaments, cervix or vagina and easily controllable haemorrhage can be repaired but there should be good general condition, desire for future childbearing and no evidence of gross infection other wise hysterectomy is appropriate for those without the above intraoperative findings.

Our hospital is tertiary care centre which receives a high number of referrals from the peripheries, which icludes tribal population, low socioeconomic status andnon instituitional delivery. The aim of study is to identify the risk factors of uterine rupture and feto-maternal outcomes of uterine rupture in our centre so that we can prevent morbidity and mortality.

Material and methods

We have done a retrospective study on rupture uterus, where we collected data from MY hospital Indore from 1st july 2009 to 30 june 2013. Patients who suffered from rupture uterus either at the time of admission or during hospital stay were included and studied for associated risk factors and fetal and maternal out come.

Result

We have studied 102 women, who were treated for rupture uterus our institute. The total number of deliveries were 48,177 in this period. The incidence of rupture uterus came to around 0.2%. About 73% of women were in the age group of 20-30 years . Most of the women were multigravida (97.1%) and around 62.7% of women were unbooked with no prior antenatal visits presenting at term. Also, it was observed that the incidence of ruptured uterus increased with increasing gestational age. Mean age of patients was 27.7. Mean parity was 2.4. Mean gestational age was 37.5weeks (Table 1).

Demographic and obstetric characteristics		**No. Of patient**	**Percentage**
Age	<20 years	4	3.9
	20-25years	28	27.4
	25-30years	47	46.07
	30-35years	18	17.6
	>35 years	5	4.9
Parity	G1	3	2.9
	G2-G4	86	84,3
	>G4	13	12.7
Antenatal care	BOOKED	38	37.2
	UNBOOKED	64	62.7
Gestational age	Pre term pregnancy	1	2.1
	Full term pregnancy	14	29.78
	Prolonged pregnancy	32	68.08

Risk factor for uterine rupture

In all the patients uterus ruptured in labour except in one patient in which there was history of lower segment cesarean section . Patients with previous two lower segment cesarean section, presented to our hospital in spontaneous labor. In one patient there was history of mayomectomy surgery for infertility and one patient presented with previous history of comlicated D&C. Maximum patients of unscarred rupture were dignoswed with obstructed labour.

s. no.	Risk factor	No. Of patient	Percentage
1	Multiparity	99	97.1
2	Previous caesareian section/ other surgery	78	76.4
3	Obstructed labour	29	28.4
4	Mal presentation Transverse Breech	12 9 3	11.7
5	Accidental haemrrhage	6	5.8
6	Prologed labour	2	1.9
7	Multiple pregnancy	2	1.9
8	Uterine malformation	5	3.04

Scareed versus spontaneus rupture

s.no.	Type of rupture	No. Of cases	percentage
1	scarred	78	76.40
2	spontaneus	24	23.50

The clinical presentation of the patients with rupture of the unscarred uterus was more dramatic with extensive tears, hypotension, and shock. Rupture of scarred uterus, on the other hand, was usually incomplete and transverse. Signs of shock were rarely a presenting feature in this group.

Intraoperatively, the estimated blood loss ranged from 1,200 to 1,500 cc. 97 patients received blood transfusion either intraoperatively or postoperatively. Other intraoperative findings are described in next table . The choice of surgical procedure was based upon the type, location, and extent of tear; patient's hemodynamic status; and desire for future fertility.

Intra operative findings

Lower segment scar rupture was found in 85.2% cases and 15 (14.7%) cases were upper segment rupture. Rupture extended to the bladder in 19 cases, and to broad ligament in four cases.76 (74.5%) patients were having complete rupture while 26 (25.5%) were having incomplete rupture. 19 patient suffered from bladder injury along with rupture uterus.

Finding and interventon	Per op finding and intervention	No. of patients	Percentage
Type of rupture	Complete	76	74.5
	Incomplete	26	25.5
Site of rupture	Lower segment	87	85.2
	Upper segment	15	14.7
complication	Hematoma	4	3.9
	Extension of rupture	10	9.8
	Bladder injury	19	18.6

Type of surgery done

53 patient underwent repair of rent with or without simultaneous tubal ligation. Rent repair required less operative time and was considered a better option for hemodynamically unstable patients. Hysterectomy was performed in 49 cases, where repair was not possible.

Repair with ligation	14	13.74
Repair without ligation	39	38.23
Obstetric hysterectomy	49	48.03
Other •Bladder Repair •Cervical Tear Repair	42 19 6	41.1

•Vaginal wall tear repair •Complete perenial tear repair •Bowel repair •Haematoma drainage	1 2 2 1	

Maternal fetal outcome

93 patients with ruptured uterus needed blood transfusion while 8 suffered from post partum haemrrhage. 8 patient died intra oeratively or post operatively. Cause of death given in seprate table. 76 (74.5%) fetus were stilborn , while 26 baby were alive.

Blood transfusion	93	91.1
Febril illness	18	17.6
Wound infection	26	25.4
UTI	22	21.5
coagulopathy	9	8.8
Burst abdomen	4	3.9
Maternal death	8	7.8
Stil born	76	74.5
Alive	26	25.4

Cause of Maternal Death

S.No.	Cause	No. of Cases	Percentage
1	Haemorrhagic Shock	05	62.5%
2	Septicemia	02	25%
3	DIC	01	12.5%

Discussion

Rupture uterus is devasting complication of obstetrics with high chances of maternal mortality if not treated timely[18]. Despite various efforts fetal survival is very low. Incidence of rupture uterus was 0.2% which is around previous studies[19] [20][21].We identified various risk factors for uterine rupture, including previous cesarean section, multiparity, malpresentations, and obstructed labour. After multiparity the single risk factor (history of prior cesarean section and) contributed in 76% of cases of uterine rupture. That is why trial of labour after previous caesarian to be given very cautiously. We can prevent 42% of uterine rupture after previous surgery , by doing caesarian section when patient land up in labour dystocia.[22]

Some litrature reports grand multipara, obstetrical trauma ,macrosomia, and malpresentation as most common risk factor for rupture uterus..(23,24,25) However, in our patient , the commonest risk factor were multiparity and previous

cesarean section. Because the trend of cesarean section, is rising patient presenting to the labor ward with a scarred uterus also raising , thereby risk of patient going in labour increases maternal morbidity, including uterine rupture.[26]

The type of the prior incision affects risk of uterine rupture. this risk differs significantly depending on transverse, low vertical, classical incision. Landon MB et al. have done study on 45,988 women and estimated uterine rupture rates of 0.7% for low transverse incisions, 2.0% for low vertical incisions, and 0.5% for unknown scars.(27) A clinical challenge is presented in the patients with an unknown prior scar is a clinical challenge to obstetrician. . The risk of rupture is 4-9% with a T-shaped or classical incision is much higher.(28)

Most common gastational age of uterine rupture was after 37 weeks of gestational age. It was located at previous scars. it was associated with uterine enlargement in the third trimesters or subclinical uterine contractions. You et al. and Bereka et al. found maximum uterine rupture >30 weeks and >37 weeks respectively [29,30].

The time that has elapsed from rupture determines the consequences of this potentially life-threatening condition . Prompt supportive and resuscitative measures need to be undertaken to avoid catastrophic events like life-threatening hemorrhage and shock.

As soon as the diagnosis of rupture uterus is made, prompt management to be started . Patient, needs immediate resuscitation and surgical intervention. Intra operative decision to be made that if rupture is repairable, it need to be repaired otherwise hysterectomy is life saving in such situation. The choice of the surgery depends upon the type, location, and the extent of the uterine rupture. many studies has considered subtotal or total hysterectomy as procedure of choice; however , some study recommend that surgical repair is a safer immediate treatment.(31,32). in our study repair was done in 52% of cases. However, after repair of ruptured uterus, there is higher chances ofrecurrence of rupture in subsequent pregnancies, with reported incidence of 4.3-19%.(33,34) Therefore, elective ceserian section should be planed in this patient in subsequent pregnancy and also if family is complete repair with ligation should be done.

Litrature show lots of variation in maternal mortility. Our study showed eight maternal death but many other studies did not find any maternal mortality after a uterine rupture.(23).However there are some studies, which reporting maternal mortality rates ranging from 0 to 13%.(35,36).

Majority of fetus were stilborn (87%). This indicates prevention of rupture and earliest diagnosis and definitive therapy that is delivery via emergent surgical intervention helpful in avoiding or reducing major fetal morbidities including fetal hypoxia, anoxia, acidosis, and fetal mortality. Delivery within 30 min after the diagnosis is made associated with good long-term neonatal outcomes.(37). However, in our study majority patient were in labour on arrival at hospital. Adequate transportation facility is also important and peripheral health staff should be trained so that these patients can be transferred to imediately.

Conclusion

Uterine rupture leads to severe maternal morbidity and fetal mortality.It can be prevented by prompt monitoring of mother at term. The major contributig risk factors are preveous surgery , obstructed labour, malpresentation and multipara. also , streantening of peripheral health system and rapid transport facility are important contributor in reducing feto-maternal outcome.

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