# RUPTURE OF THE UTERUS

## (A study of 52 cases)

by

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Rupture of the uterus still remains one of the most serious obstetric complications. Despite all modern advancement in the surgical care and blood transfusion, the maternal mortality associated with this condition still remains high.

The aim of this paper is to analyse and find out ways and means to bring down the mortality and morbidity attributed to this complication.

### *Material and Methods*

Fifty-two cases of uterine rupture which were admitted in our unit of Zenana Hospital, Jaipur, during 1963 to 1969 have been analysed. The incidence during this period is 1 in 305 as shown in Table I and compared with that of others. The incidence was 1 in 311 during the period 1956 to 1962.

### *Age and Parity*

As seen in Table II the maximum number of cases were between 21-35 years of age as is also reported by Patel and Parikh (1960), Choudhari (1961), Shastrakar (1962) and Prabhawati and Mukherji (1963). In Randle Short's series (1960) the maximum incidence was

TABLE II

*Shows distribution of cases according to various age groups*

| S. No. | Age group | No. of cases |
|---|---|---|
| 1. | 20 years | 1 |
| 2. | 21-25 years | 9 |
| 3. | 26-30 years | 26 |
| 4. | 31-35 years | 11 |
| 5. | 36-40 years | 5 |
| | Total | 52 |

TABLE I

*Shows the incidence of rupture of uterus as reported by various authors*

| Authors | Incidence | Years | Maternal mortality |
|---|---|---|---|
| Das Gupta (Calcutta) | 1 : 1800 | 1950-53 | 32.5% |
| Patel and Parikh (Bombay) | 1 : 1257 | 1955-59 | 27.5% |
| Menon (Madras) | 1 : 415 | 1953-59 | 10% |
| Prabhawati & Mukerji | 1 : 167 | 1960-69 | 33.3% |
| Subhadra Devi (Visakhapatnam) | 1 : 164 | 1960-62 | 33.3% |
| Shastrakar (Nagpur) | 1 : 256 | 1952-60 | 50.9% |
| Ferguson Reid (Boston, U.S.A.) | 1 : 1204 | 1935-55 | 5.9% |
| Rendle Short | 1 : 93 | 1952-58 | 36.8% |
| Our series | 1 : 305 | 1963-69 | 44% |

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between 21-30 years. It is also seen in Table II that rupture of uterus is rather rare below 20 and above 40 years of age. This is explained by the fact that there is preponderence of primipara in younger age group i.e. below 20 years and less fertility above 35 years of age. Actually the age group 21-35 years is that of maximum child bearing. There are more elderly patients in our series, the reason probably appears to be that many grande multiparae who are particularly prone to uterine rupture fall in the later age group.

*Parity*

Table III shows that as many as 28 cases

TABLE III

*Shows the parity distribution in the present study*

| Parity | No. of cases |
|---|---|
| Primipara | 1 |
| 1 | 4 |
| 2 | 2 |
| 3 | 6 |
| 4 | 11 |
| 5 | 6 |
| 6 and above | 22 |
| Total | 52 |

were para five and over, the rest of the patients were para 4 and under. Krishna Menon from Madras has found high percentage in his series of this group for which no etiology could be found. Highest parity noted in our series was 10. A single primiparous patient with a ruptured uterus came under our care. This is also noted by Subhadra Devi (1956) 3 cases, Patel and Parikh (1960) 1 Randle Short (1960) 7 and Menon (1962) 2 cases. In Eastman's series no case of rupture in a primipara was seen. A primiparous uterus reacts to obstruction by inefficient uterine action of hypotonic variety unlike the multiparous reacting by hypertonic uterine action. It is well known that multiparous uterus is more liable to rupture for the following reasons:--

(i) Increased fibrous tissue in myometrium with increased parity.

(ii) Unrecognised minor degree of disproportion due to undiagnosed large baby associated with undetected pelvic contraction.

(iii) Malpresentations and mild degree of osteomalacic pelvis in multipara.

(iv) Weakness of the uterine wall due to malnutrition.

(v) Munro Kerr states that weakness of the lower segment due to overstretching and probably bruising in a previous pregnancy results in rupture in next pregnancy.

(vi) The hypertonic activity of the multiparous uterus is the causative factor. The uterus of a multipara is resentful and tries hard to overcome the obstruction which in turn stimulate voilent uterine action with the risk of spontaneous uterine rupture.

*Causes of rupture*

The etiology of rupture of the uterus is fast changing over from cephalopelvic disproportion and misuse of oxytocics to a previously damaged uterus. In Western countries the commonest cause is a rupture of previous ceasarean section scar. In our country, however, we do see cases of ruptured uterus due to obstructed labour and other complications. Table IV shows etiological factors in the present series. The rupture of the uterus is divided into two main groups, traumatic rupture due to clumsy obstetrics, and spontaneous rupture which may either be of an intact or scarred uterus.

In our series 92.3% of the cases were spontaneous, higher than the cases reported by Choudrari 82.05% and Shastraker 78.1%. In our cases 9.2% were traumatic

TABLE IV

*Showing etiological factors in the present series*

| Etiology | No. of cases | Percentage |
|---|---|---|
| Contracted pelvis | 8 | 25% |
| Hydrocephalus | 4 | |
| Transverse lie | 20 | 41.6% |
| Grand multipara | 12 | 25% |
| Unknown | 3 | 8.4% |
| Scar rupture | 1 | 0.5% |
| Traumatic rupture (Vaginal manipulations) | 4 | 9.2% |

in contrast to 21.9% in Shastraker series. The scar rupture was 0.5% and it is considerably lower than in the series reported by Choudhari (1961) 17.9% and Shastrakar (1962) 20.9%.

In our series disproportion accounted for 25% of spontaneous rupture in contrast to the 37.2% reported by Shastrakar and 36.9% by Menon.

In 41.6% of cases there were malpresentations and all were cases of transverse lie in contrast to 27.9% reported by Swami and Patel (1960), Shastrakar (1962) 30% and Menon (1962) 18%.

Grand multiparity as such without any associated cause was responsible for 25% of the cases in contrast to 46% in Shastrakar's and 8% in Menon series. In 8.4% of the cases no etiological factor could be found.

*Pathological anatomy*

In our series 61.7% of the cases had complete rupture and rest 38.3% had incomplete. Prabhawati and Mukerji found complete rupture in 75% and incomplete in 25% of the cases.

*Analysis of site of ruptures*

Upper segment 4.

Lower segment 43.

Out of these upper segment tear the details are as follows:

1. Transverse at fundus 3.

2. Transverse at fundus and right lateral wall 1.

Out of the lower segment tear the details are as follows:

*Incomplete* 18

(a) Transverse 11.

(b) Transverse extending to left broad ligament 5.

(c) Transverse extending to both broad ligaments 1.

(d) Transverse extending to posterior wall of uterus 1.

*Complete* 25

(a) Rupture of previous lower segment scar 1.

(b) Transverse tear, anterior wall 12.

(c) Transverse tear extending to both broad ligaments 1.

(d) Transverse tear extending to right broad ligament 3.

(e) Transverse tear extending to left broad ligament 6.

(f) Oblique tear extending to left broad ligament 1.

(g) Oblique tear extending upto posterior fornix 1.

In the majority of the cases the lower segment had ruptured and in the maximum number of cases the lower segment had transverse tear in the anterior wall which extended to the broad ligament on one or both sides or posterior wall of the uterus. Prabhawati and Mukerjee (1963), Randle Short (1960), Patel and Parikh (1960), Choudhari (1961), also have recorded transverse rupture in the anterior wall of the lower segment as the commonest variety. As seen by others, in none of our cases the bladder was involved. In 4 cases, haematoma was present under the uterovesical fold of peritoneum. Shastrakar had 4 cases of involvement of bladder out of 55 cases and in Randle

Short's (1960) series bladder was involved 10 times.

In cases of lower segment rupture, in 12 cases tear had extended more on the left side and in 6 of these there was associated rupture of the uterine blood vessels on the same side. It is commonly believed that ruptures are more common on the left side Randle Short (1960), Shastrakar (1962) and Prabhawati and Mukherji (1963). Various explanations are offered for the higher incidence of left sided rupture.

1. It is due to the physiological dextro-rotation of the gravid uterus so there is distension and stretching of left side of uterus and broad ligament than the right and hence more frequent rupture on left side (Nystrome 1956).

2. It is attributable to the manner in which the left ovarian vein enters the left renal vein at an angle of 90 degrees and thus favours the development of passive venous congestion in the left broad ligament (Dee Lee and Greenhill 1955).

3. As the occiput most frequently presents on the left side the lower segment is consequently subjected to special strain during labour and hence rent is usually found in this region.

4. It might also be due to the fact that the already distended and stretched left lower segment is being inadvertently traumatised by right handed obstetricians while starting to perform any obsterical manipulations in a case of obstructed labour.

*Clinical features and diagnosis*

The clinical picture depends upon the type of rupture and varies from no symptoms at all to complete collapse. The classical picture was present in about 28.8% of cases. In the series reported by Prabhawati and Mukherji (1963) 56.6% of the cases showed classical signs. The clinical features seen in our series are shown in Table V. In most of the cases

TABLE V
*Showing the clinical features*

| Clinical Features | No. of cases |
|---|---|
| Absence of foetal movements | 2 |
| Cessation of labour pains | 10 |
| Prolonged labour | 44 |
| Signs of collapse | 15 |
| Loss of uterine contour | 24 |
| Abdominal tenderness | 10 |
| Palpable superficial foetal parts | 30 |
| Absence of foetal heart sounds | 52 |
| Tonically contracted uterus | 15 |
| Presentation and position not made out | 17 |
| Distension of abdomen and paralytic ileus | 22 |
| Vaginal bleeding | 9 |
| Haematuria | 6 |
| Pain in right shoulder | 1 |

combination of these clinical features were present. Most of the patients in the present series presented a clinical picture of prolonged labour. A restless, exhausted and dehydrated woman in labour with tenderness in the lower abdomen needs a very alert obstetrician to carefully watch for any signs of threatened rupture or ruptured uterus.

The pain in the right shoulder was the complaint in one case and also in 2 cases of Shastraker's series. In our series no case of injury to the bladder was found though there was haematuria in 6 cases.

Incomplete ruptures usually does not present the classfical picture and hence are often missed till the condition deteriorates beyond a hopeful prognosis. One has to be "rupture uterus minded" in order to avoid any slip in the early diagnosis. Possibility of incomplete rupture should always be kept in mind in all cases of prolonged and obstructed labour where the uterus is retracted and tender with ill-defined outline and absence of signs of shock and collapse. In these cases there may often be tenderness over the region

of the uterus usually to one side if a haematoma has formed in the broad ligament or lower uterine segment. The patient after delivery goes into severe shock. As stressed by Menon also exploration of the uterus should be done in all cases of difficult labour. The diagnosis on admission could not be made in four cases which were of incomplete rupture because the uterus was tense and there was associated abdominal distension and the presentation and the position of the foetus could not be made out. Vaginal manipulations were done in these cases and on exploration the rupture was detected.

The uncommon features that were observed in the present series were:

1. *Persistent suprapubic pain:* This was the only complaint in case of incomplete rupture along with history of prolonged labour. Tenderness in the lower abdomen was marked. The satisfactory general condition, normal pulse and blood pressure can mislead the obstetrician in early diagnosis.

2. *Distension of the abdomen:* Peritoneal irritation was so marked in certain cases with toxic look, high fever and foul-smelling discharge, that one was inclined to diagnose these cases as peritonitis or intestinal obstruction and mask the clinical picture of rupture. The signs of shock and haemorrhage were not present. Prognosis becomes worse in these cases because conservative treatment was given till correct diagnosis was made.

*Management*

Prevention of this catastrophe is the ideal treatment. Increase in the existing antenatal and intranatal facilities, education of the public in making use of the services of the trained personnel, early admission in a large hospital of the cases with previous bad obstetrical history including cases of previous caesarean section and limiting the families will definitely lower the incidence of rupture of the uterus. Early diagnosis is the real key to improve maternal and foetal salvage. Intrauterine manipulations should be done cautiously in neglected cases of obstructed labour only by an experienced obstetrician. The exploration of the uterine cavity for any evidence of rupture after a difficult vaginal delivery should be made routinely as immediate treatment gives better results. Once rupture has occurred, immediate blood replacement and early surgical intervention gives the best chance of survival for the patient.

Rupture of the uterus is one of the most serious accidents of pregnancy and labour, often resulting in death of the mother and foetus. The factors influencing the prognosis are:

1. Time interval between rupture and operation.
2. Amount of haemorrhage and degree of shock.
3. Availability of blood transfusion.
4. Promptness in diagnosis and nature of treatment, whether repair or hysterectomy.
5. Type of rupture and the severity of associated infection.

The prognosis is best in rupture of caesarean scar, better in lower segment than classical one, more so when the placenta is not situated over the scar, than from spontaneous or traumatic.

The management of a case of rupture uterus consists of resuscitation and exploration followed by minimum surgery consistent with the extent and type of tear. Type of surgery can only be decided after the abdomen is opened and depending upon the degree and type of tear and also on the patient's condition to be able to withstand the procedure decided upon. Most of our cases were in poor clinical state and due to lack of availability of

blood transfusion the patients were taken for exploration without it. In the present series blood transfusion could be given only in 20 cases, the amount varied from one to two units.

Table VI shows the surgical treatment and maternal mortality. Table VII shows a further analysis of maternal mortality in different treatment groups and compared with other authors. Hysterectomy was done in those cases where the suturing of the rent was impossible, the tears were extensively ragged and extended up to the broad ligament on one or both sides and involving the blood vessels. In one case hysterectomy was done after doing the repair as uterus was atonic and did not respond to massage and oxytocics. The mortality is more in cases where hysterectomy was performed.

Out of 34 cases of repairs one case was not sterilised as the tubes and ovaries on both sides could not be visualised due to dense adhesions. In five cases in whom there was one or no living child, sterilisation was done as the patients were from villages where no facilities of antenatal supervision in next pregnancy was available.

The maternal mortality is less in the repair group as it is much less shock producing operation and less time consuming than hysterectomy. It is indicated in cases where the tear is regular and repairable, in rupture of caesarean section scar which is clear cut, in young women to preserve the childbearing function and at least menstrual function in cases where the patients are sterilised as well and gives the young woman the psychological satisfaction of her womanhood. The associated infection can be effectively controlled in these days by broad spectrum antibiotics. We agree with Gupta (1956), Swamy and Patel (1960), Patel and Parikh (1960) and Sen (1961) who are in favour of repair of tear.

Anaesthesia: All our patients were given general anaesthesia.

TABLE VI

*Showing surgical treatment and maternal mortality*

| Type of Surgery | No. of cases | Maternal death | Mortality |
|---|---|---|---|
| 1. Suturing of rent alone .. .. | 1 | Nil | 35.2% |
| 2. Suturing of rent and sterilisation .. | 33 | 13 | |
| 3. Hysterectomy | | | |
| Subtotal | 2 | Nil | 38.4% |
| Total | 11 | 5 | |

TABLE VII

*Shows a further analysis of maternal mortality in different treatment groups and compared with other authors*

| Author | Total | Not operated | Repair of rent | Subtotal hysterectomy | Total hysterectomy | Mortality |
|---|---|---|---|---|---|---|
| Rendle Short | 171 | 29 | 62 | 80 | .. | 25.4% |
| Menon | 164 | 12 | 29 | 49 | 79 | 10.6% |
| Patel & Parikh | 41 | 1 | 25 | 14 | 1 | 25.5% |
| Present series | 52 | 5 | 34 | 2 | 11 | 44% |

*Maternal Morbidity and Mortality*

Rupture uterus is attended with a high morbidity and mortality. Table VIII show the maternal morbidity.

TABLE VIII
*Showing material morbidity*

| Maternal Complications | No. of cases |
|---|---|
| Haemorrhaje & shock | 24 |
| Haemorrhage & sepsis | 1 |
| Broad Ligament haematoma | 10 |
| Pulmonary and cerebral embolism | 1 |
| Pyometra | 3 |
| Pelvic abscess | 2 |
| Peritonitis | 2 |
| Peritonitis and paralytic ileus | 8 |
| Urinary infection | 4 |
| Subacute intestinal obstruction | 1 |
| Hyperpyrexia | 4 |
| Wound sepsis | 4 |
| Vesicovaginal fistulae | 3 |
| Tetanus | 1 |

It can be seen that 48% suffered from ill-effects of haemorrhage, 42% manifested sepsis in spite of routine antibiotics cover. In 3 cases vesicovaginal fistulae developed; these patients were admitted in prolonged labour and in no case instrumentation was done. Unduely prolonged trials are no longer justifiable and timely interference can save a lot of maternal morbidity.

There were 23 maternal death out of 52 cases i.e. 44.2%. The important causes of death were shock, haemorrhage, sepsis, parlytic ileus and peritonitis. The maternal mortality given by various workers is shown in Table I.

Five patients who were in collapsed condition died before any surgery could be done. In the rest of the patients the death was attributed to shock and haemorrhage in 12 cases, haemorrhage and sepsis 2 cases, paralytic ileus and peritonitis 2 cases, Pulmonary and cerebral embolism one case and tetanus one case.

Foetal mortality was 100% in our series.

*Discussion*

The incidence of rupture of the uterus is more or less remaining constant from 1956 uptill now in our State due to lack of proper antenatal care and trained personnel in the villages. Multiparity and obstructed labour still remain our main etiological factor.

Mahfouz (1959) suggests that the role attributed to high multiparity may be over, emphasized. He suggests that there is an individual susceptibility, while others believe that more careful enquiry into the past history will usually discover an etiological factor. According to Eastman (1947) increasing parity and age predispose to uterine rupture and constitute the most important cause of spontaneous rupture other than previous caesarean scar ruptures. There are many cases of silent uterine rupture, without anything to account for the cause of rupture (Menon 1962). One has to believe or presume that there is certainly some individual susceptibility also besides the changes brought by age and parity. Menon (1962) suggested that ruptures which occurred in his cases were para four and under and after a short labour may be due to inherent or acquired weakness of uterine musculature as a part of general body weakness due possibility to malnutrition and protein deficiency aggravated by pregnancy so common in India. If the malnutrition is prevented or completely corrected can rupture be prevented? What changes occur in multiparous uterus to cause early rupture while not affecting the contractility is not well understood. It is certain that if ignorance is prevented by good antenatal and intranatal care it will certainly help the pregnant woman not only in the prevention of rupture uterus but many other complications.

The injudicious use of oxytocic drugs may cause rupture of the uterus. But the main cause is mismanagement of labour especially in villages where there are no trained midwives, general practitioners and obstetricians and lack of proper transport facilities to transfer the patient in district hospitals.

The diagnosis of the rupture of the uterus is difficult sometimes specially incomplete rupture. The clinical picture depends upon the site and type of rupture. The delay in diagnosis involves delay in the treatment affecting mortality in direct proportion. The mortality is the mortality of delay in sending the patient to the obstetrician and delay in the diagnosis and treatment. According to Ingram *et al* (1952) to diagnose the occult rupture early the condition must be suspected frequently. The term "occult rupture" is applied to cases which do not exhibit classical symptoms and hence are difficult to diagnose. Occult rupture tests the diagnostic acumen of obstetrician, Ingram (1952). One has to think of this condition more often, like ectopic pregnancy, to be able to make an early diagnosis. To improve the maternal mortality the condition must be suspected and diagnosed early. To diagnose the condition of occult rupture early one must be "rupture uterus minded". Once the condition is diagnosed laparotomy must be performed as early as possible under blood transfusion.

The high maternal mortality in our series is mainly due to delay in sending the patients with prolonged and obstructed labour to a maternity institution and unnecessary handling by untrained personnel causing rupture in obstructed cases, and resultant sepsis. The other important factor is non-availability of blood transfusion.

*Summary*

1. Fifty-two cases of rupture of uterus were studied over a period of 7 years. The incidence of rupture uterus was 1: 305.

2. There was only one primigravida in the present series.

3. All the patients were emergency admissions.

4. The common etiological factor was obstructed labour, either due to contracted pelvis or transverse lie.

5. Five out of 52 cases died before any thing could be done.

6. Hysterectomy was performed in 13 cases and suturing with sterilisation in 33 and suturing alone in one case. The mortality in hysterectomy group is higher than the repair group.

7. Blood transfusion was given to only 20 cases due to its non-availability.

8. General anaesthesia was given to all the patients.

9. Twenty-three maternal deaths occurred in this group. Maternal mortality was 44.2%.

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