

## Rupture of the pregnant uterus – A 20 year review

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### Abstract

Nepal is a land-locked developing country located in between China and India with a population of 2.34 millions. The male: female ratio being 49:51 and very high maternal mortality. (539/100,000 live birth – 1996) The geography of the country makes the situation very much divergent and difficult to cater the health services, especially operative procedures in remote places. **The aims of the study are:-** 1. To find out the incidence of R.U, distance from where the patients came, age, parity antenatal attendance, type of rupture, type of intervention and foetal outcome. 2. To suggest the concerned authorities to focus their attention to strengthen and expand comprehensive emergency obstetric care service (CEOCS) in remote areas of the country. **Material and method:** This is a retrospective study of rupture of pregnant uterus (RU) after 28 weeks of pregnancy for the period of 20 years from 1985 to 2005 A.D. (2042-2061 BS) admitted in the very busy tertiary centre for women (Maternity Hospital, Thapathali, Kathmandu.) with approximately 16000 deliveries and 11% Caesarean section rate per year. Available charts from hospital records of cases of R.U. admitted for the period of 20 years were analysed. During the period, 251 cases of R.U. were admitted. **Result:** There were 272245 live births, 25819 Caesarean section, 270 maternal deaths and 11197 perinatal foetal deaths, during the study period. Incidence of rupture of pregnant uterus was (0.09%) 1:1100 live-birth. There were 60% spontaneous, 29% scar rupture and 11% traumatic rupture. Maximum cases were brought from distance of more than 70 kilometres away, between 25 – 29 years of age, (mean age 28.7), of third and fourth gravida at 36 – 40 weeks of gestational period with 68% without antenatal attendance. Seventy percent (70%) had complete rupture. Sixty percent (60%) were managed with suture repair with bilateral tubal ligation, 24% had only repair and 15% had hysterectomy. The case mortality of R.U. (n=20) was 7.9%. Two percent (n=5) cases died before intervention due to arrival in moribund condition. Seventy five percent (75%) cases had stillborn babies. **Conclusion** More cases of RU are coming to the hospital due to better communication and awareness of the people outside the capital, and case- mortality is reduced compared to previous years.

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Nepal is a land-locked developing country of “Mount Everest” located in between China and India with an area of 147181 sq km. The plane land available is 33%, other area is covered with hills and mountains. The population is 2.34 millions. The male: female ratio is 49:51 and having very high maternal mortality 539/100,000 live birth – 1996 and infant mortality of 64/1000 live birth The geography of the country makes the situation very much divergent and difficult to cater the health services, especially operative procedures in remote places due to lack of roads.

The rupture of the gravid uterus is one of the causes of maternal mortality in Nepal mainly due to the obstructed and prolonged labour taking lots of time to reach the health facilities.

Many women are dying at home as the home delivery takes place in 92 % of cases due to culture, taboos, lack of awareness and low socio-economic and poor educational status. Four thousands women die due to complications of delivery per year.

### *The aims of the study are*

1. To find out the incidence of R.U, distance from where the patients came, age, parity antenatal attendance, type of rupture, type of intervention and foetal outcome.
2. To suggest the concerned authorities to focus their attention to strengthen and expand comprehensive emergency obstetric care service (CEOCS) in remote areas of the country.

### **Material and method**

This is a retrospective study of rupture of pregnant uterus (RU) after 28 weeks of pregnancy for the period of 20 years 1985-2005 (2042-2061 BS) admitted in the very busy tertiary centre for women (Maternity Hospital, Thapathali, Kathmandu.) with approximately 16000 deliveries and 11% Caesarean section rate per year.

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Total registers of admission for delivery cases for the year 1985 mid April to 2005 mid April (2042—2061 B.S.), 20 years were taken out and “Rupture uterus” cases were analysed. There were 272245 cases admitted for the delivery. Two hundred and fifty one cases were labelled as Rupture Uterus. Analysis of these cases was done.

### Result

The incidence of RU was found to be 0.09 % (1:1100 live birth). Fifty five percent (n=138) were brought from far off more than 70 Km away from the centre due to the high way roads facility. The mean maternal age was 28.7 years with majority (56 %) 25 to 34 years. Twenty-five per cent were third and grand multipara, 24% were second gravid, and another 20 % were fourth gravid patients. Average children were, 2.8 with exclusion of primigravida. Twenty-nine percent (29%) (n=73) had attended 1—4 visits of antenatal care clinic (ANC) .Sixty-eight per cent (n=172) had not attended, and 2% (n=6) had no record of ANC. Forty four percent of the patients (n=110) had ruptured the uterus at 38-40 weeks of gestation. The type of lesion was complete rupture in 70% (n=175) cases, 25% (n=64) cases presented with incomplete rupture and in 12 records, the nature and the site of lesion was not mentioned.

There were 150 (60%) cases with Spontaneous rupture of the uterus. Of these, 62 (41%) cases presented with neglected shoulder presentation and hand prolapsed for last 4—24 hours, 13 (9%) had transverse lie, 5 (3%) had cord prolapse,15 (10%) had Hydrocephalic foetuses with or without hanging breech,4 (3%) had first twin delivered at home,4 (3%) had uterine malformation-Bicornuate uterus, among other 6 (4%),1 had mento-posterior position ,1 had bony mass in the sacral region, three cases had H/O V.V.F. repaired and band in the vagina and 1 had uterine perforation during Evacuation of the uterus previously. Rest 36 (24%) patients had prolonged labour and arrived with R.U. Five (3%) cases of RU were brought in moribund condition and died before any treatment was started.

There were 74 (29%) cases of Scar rupture, 3 had hand prolapsed as well. Among the cases with previous CS, 67 had one, 2 had 2, and 1 case had 3 scars. Two cases were having Upper Segment CS, and 2 had inverted T-scars.

Twenty-seven cases (11%) had **traumatic (Iatrogenic)** RU due to oxytocic infusion (n=19) and manual intervention such as internal podalic version (n=3), manual removal of placenta (n=2), forceps delivery (n=1) and vacuum delivery (n=2).

**Table 1:** Types of operative treatment

| Treatment                | No.        | %  | RUD       | %          |
|--------------------------|------------|----|-----------|------------|
| LSCS/Repair              | 61         | 24 | 5         |            |
| LSCS/Repair BTL          | 151        | 60 | 6         |            |
| Subtotal hysterectomy    | 24         | 10 | 4         |            |
| Total hysterectomy       | 7          | 3  | 0         |            |
| TAH RSO/LSO              | 2          |    | 0         |            |
| Died before intervention | 5          | 1  | 5         |            |
| O.T. note not available  | 1          |    | 0         |            |
| <b>Total</b>             | <b>251</b> |    | <b>20</b> | <b>7.9</b> |

RUD = Death due to rupture of the uterus

Sixty percent patients were treated with LSCS/Bilateral tubal ligation (BTL)Sixty percent (n=151) of RU cases had repair of the rupture and bilateral tubal ligation (BTL), 24% (n=61) had hysterectomy out of which 24 had subtotal, 7 had total with conservation of both ovaries and 2 had one ovary conserved. Five cases died before intervention and one case had no operation note (Table 1).

Foetal out come in case of RU was very poor, 75% (n=187) had foetal death. 15 cases were hydrocephalic foetuses and there were 4 sets of twins. Forty six cases had alive and well babies, 5 had neonatal death, 14 cases – not mentioned about foetal out come and 3 cases died before delivery.

**Table 2:** Foetal outcome

|                                        | Male | Female | Total | %   |
|----------------------------------------|------|--------|-------|-----|
| Alive                                  | 25   | 21     | 46    | 18  |
| Neonatal death                         | 3    | 2      | 5     | 2   |
| Stillborns                             | 120  | 67     | 187   | 73  |
| Hydrocephalus                          | [12] | [3]    | 15    | [6] |
| Not mentioned*/not known* <sup>1</sup> | 17   | 0      | 17    | 7%  |

\*Patient died before intervention

\*1. There were 4 twins.

There were 20 maternal deaths due to RU which is 7.9% of the death during the study period. Out of 20 cases, maximum (50%) had death at 30-34 years and para 4. Spontaneous rupture cases were 17 out of which hand prolapse<sup>6</sup>, hydrocephalic 3, grand multi<sup>4</sup>, died before operation<sup>3</sup>, hospital case 1, scar rupture 1, death in iatrogenic group was 2, one had oxytocic, vacuum delivery followed by PPH for which subtotal hysterectomy was done. Second case died following oxytocic had normal delivery and postpartum haemorrhage probably RU occurred second stage of labour.

## Discussion

### Incidence

The total incidence of RU in this study was 1:1100 deliveries (0.09%) in mostly unbooked (app. 73%) patients. Schrinky (1978) in his review article the incidence of uterine rupture is 1:1000-1500 delivery in the US and its incidence is increasing<sup>1</sup>. Eden at al (1986) in his a 53 years the incidence was reported 1:1424. Fedorkow (1987)<sup>4</sup> in his 21 year review incidence of rupture of the pregnant uterus in urban referral hospital in Malaysia report to be variable from urban to rural settings<sup>5</sup>. Chameso B. (1995) had reported the frequency of occurrence of R.U. to be 1:38 deliveries<sup>6</sup> at S. G. Hospital, South Shoha, Ethiopia. Al Sakka at al (1998) (1999) have reported the incidence of R.U. to be 0.017% and 0.012% at the women's hospital, Hamad Medical Corporation, Doha, Qatar<sup>10, 11</sup>. Abiodun et. al. (2001) have reported the incidence 1:210 deliveries at the University of Illorin Teaching Hospital, Nigeria<sup>12</sup>. Vangeenderhuysen and Saudi have reported 2.3% of uterine rupture at maternity department of Gazobi Hospital in Niamey, (Niger)<sup>13</sup> Kumari et. al (2003) have reported the incidence of RU to be 1.4/1000 deliveries at dept. of ob/gyn, Govt. Medical College & Hospital, Chandigarh, India<sup>17</sup>. Ezegwui & Nwogu-Ikojo (2005) reports the incidence of RU to be 1:106 cases at department of ob/gyn, UNTH Enugu Nigeria<sup>15</sup>. Ezechi et. al (2004) have reported ratio of RU to be 1:273 at Obafemi Awolowo University

teaching Hospital<sup>14</sup>. Ozdemir et. al. (2005) has reported RU to be 1:6888 deliveries at Turkey<sup>16</sup>.

### Age

The mean maternal age was 28.7 years with the majority 141 (56%) of the cases between 25 to 34 years in this study and 5% below the age of 19. Nkata (1996) reports the range of 15 to 46 years (mean 23(SD) years in his study<sup>8</sup>. Al Sakka et. al. (1998) reported the range of age to be 24 to 42 (mean 32.68)<sup>10</sup>. Abiodun et al have reported the highest risk of RU at 40 years and above, followed by those aged 30-34, and least prone below 20 years of age<sup>12</sup>. In Vangeenderhuysen & Souidi's series (2000) mean age was 29 years<sup>13</sup>. Ezegwui (2005) reported mean age to be 31.2 years with majority (90.3%) between 25 & 39 years<sup>15</sup>.

### Parity

In this study, third gravida 9 (25%) and grand multips (25%) (Mean parity 2.7%) were having RU and there was no antenatal care (booking) attended during the pregnancy in 69% (n=172) of the cases. The type of rupture in this study was found to be 60% spontaneous 29% scar rupture and 11% traumatic (iatrogenic). Shrinky and Benson (1978) in their review, spontaneous about 25%, of the total and 17% of those occurred before onset of labour and previous CS was the most common predisposing factor. Kumari et. al.<sup>18</sup> had reported 68% RU was associated with scar. Fedorkow et.al (1987) in their earlier study, non attendant of ANC, previous scar, history of dilatation curettage or laparoscopy was also implicated. They have reported that rupture also occurred in patients at low risk<sup>4</sup>. Similar findings have been reported by Chamiso B<sup>6</sup>, N Kata<sup>8</sup> M, Alsakka<sup>10,11</sup>. Abiodun<sup>12</sup> Vangeenderhuysen<sup>13</sup>, Ezechi<sup>14</sup>, Ezegwui<sup>15</sup>, Ozdemir<sup>16,17</sup> and Kumari<sup>18</sup>.

### Causes

Chamiso B<sup>6</sup> (1995) in his previous studies reported the commonest cause to be neglected shoulder presentation (63.2%), brow and face presentations

29.8% which is almost similar to present study in which there were 62/150 shoulder presentation with hand prolapse. Soltan et. al. (1996)<sup>7</sup>, N Kata<sup>8</sup> (1996), Al Sakka et al (1998) (1999)<sup>10,11</sup>, Abiodun et. al. (2001)<sup>12</sup>, Vangeenderhuysen (2002)<sup>13</sup>, Ezegwui<sup>15</sup> Ozdemir et. al.<sup>16</sup> (2005) in their study oxytocic stimulation, grand/high multiparity, prolonged labour obstructed labour, undiagnosed mild hydrocephalus were contributing factors for spontaneous rupture, previous caesarean section for scar rupture and oxytocin & prostaglandin stimulation of labour and forceps delivery to be contributing factors for RU.

#### ***Site, type of rupture and type of intervention***

In the present study 70% (n=175) was found to have complete rupture (n=64) 25% incomplete and there was “no mention” in 5% (n=12) cases and there was one case having rupture in the posterior wall of the uterus leading extension of foetus in the peritoneal cavity and one case had extension of the rupture up to the vagina. Seventy per cent of (n=52/74) scar rupture presented with complete rupture. In a study<sup>8</sup> complete rupture in 70% cases and bladder injury was found in 23%. The operative treatments given were, repair and bilateral tubal-ligation in 60% (n=151) cases in the present study. Only repair was done in 24% (n=61) cases to preserve the reproductive potential of the patient. Ten per cent (n=24) had subtotal hysterectomy, out of the 6% (n=15) had total hysterectomy with conservation of one or both ovaries. Five cases died before intervention and one had lost operation note.

Prompt interventions are keys to good foetal & maternal outcome. The choice of surgical procedure depends upon the type, extent and location of the rupture as well as the patient’s condition and desire to preserve her child bearing capacity<sup>1</sup>. A proposition for individualised treatment outlined, concluding that repair should be performed when suitable to preserve the patients reproductive potential but hysterectomy is preferable when the rent is extensive, bruised and contaminated<sup>2,7,11</sup>.

N Kata<sup>8</sup> had reported subtotal hysterectomy in 47% C.S. with uterine repair in 27% uterine repair only in 8/30 and bladder injuries repaired in 5/30 cases. Similar types of procedures have been reported by Al Sakka et. al.<sup>10</sup> and suggests that the RU should be kept in mind in the care of obstetric patients. Abiodun et. al.<sup>12</sup> and Ezegwui et. al.<sup>15</sup> have reported the type of surgical treatment to be repair + BTL 36% & 29.2; Repair alone 28% and 17.1% in their studies. Ozemir et. al.<sup>(16)</sup> have performed hysterectomy in 70.6% of which 25% had subtotal hysterectomy and 29.4% had suture repair.

#### ***Foetal outcome***

Foetal outcome was very poor in this study period. There was 11197 perinatal death i.e. 41/1000 live birth among the study period (n=192 SB 187, NND 5) 75% of the foetuses were still born giving rise to per 750/1000 live birth.

Maternal mortality was 20 during the study period giving 7.9% case mortality. There was total maternal mortality of 270 cases 0.99/1000 deliveries out of 272245 live births. Kumari et al<sup>18</sup> had reported maternal mortality to be 8% and perinatal mortality to be 68%.Caesarean section (CS) rate had risen from 5 to 11% during the study period rupture of the CS scar was 0.29% in the admitted cases (74/25819) during the study period. Rachagan et. al.<sup>5</sup> reports that early diagnosis and prompt treatment will further help to reduce morbidity and mortality to both mother and foetus. Mulumba N Kata<sup>8</sup>, reports that mortality did not differ significantly in patients who underwent hysterectomy and those treated by uterine repair and foetal mortality to be 100%.

#### ***Comments***

In Nepal around ninety two percent of the delivery takes place at home without trained health care person’s guidance (NHS-1996) such as the mother’s close relatives or untrained birth attendant who cannot diagnose obstructed labour or high risk factors during parturition. Lack of education, poverty and taboos are contributing factors for not taking “child-birth” seriously. Even if the health-facility is available, they are not readily accepted by child bearing mothers due to the family/gender male dominancy culture, they take the process of parturition very lightly and also due to economical condition and the facility not being easily reachable (accessible). The cases were brought to the tertiary centre from surrounding districts only where there was provision of highway-roads. Those women who don’t have facility of mother care to reach health care are helplessly dying at home. Around 4000 women are dying every year due to child-birth complications. Therefore, it is strongly suggested to train all volunteer health workers of all villages in recognising “high risk” factors during pregnancy and in early referred. Every health posts and health centres there must be one room reserved for parturition with minimal facility for provision of BEOC service. There should be facility of transport for referring the case to CEOC centres which should be made available in all district hospitals. The zonal and central hospital should supervise and train the lower level health personnel and community health volunteers. The educational status of women should be raised. Then only the maternal morbidity and mortality will be reduced.

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