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## OBSTETRICS

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# The Changing Face of Rupture Uteri

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### ABSTRACT

- Objective** To find out the incidence and determine causes of rupture uteri in Rayong Hospital.
- Design** Case analysis.
- Setting** Obstetric unit, Rayong Central Hospital, Rayong, Thailand.
- Subjects** All cases of rupture uteri treated at Rayong Hospital during 1992-1999.
- Result** There were ten rupture uteri during the period of 1992-1999 treated in Rayong Hospital. All of them were unscarred uterus. The most common cause was mismanagement of second stage of labour resulting from inadvertent use of anesthesia and analgesia. The other causes were use of oxytocin and macrosomia. There was one perinatal death and one maternal death. The maternal case fatality rate was ten percent.
- Conclusion** All uterine ruptures in Rayong hospital should have been preventable if the accoucheurs had been well trained and exercised proper cares for the patients. Anesthesia, analgesia and oxytocic drugs should be used with extreme caution. The good referral system and team is a must for treatment of serious rupture uteri.

**Key words :** Uterine rupture, unscarred uterus

Uterine rupture is one of the serious complications of pregnancy. Most of ruptures occur during labour in parturients with scarred uterus.<sup>(1,2)</sup> Rupture of unscarred uterus are rare and occur more frequently in older multiparous women. The ruptures of pregnant uterus in Rayong hospital were different clinically from those described above. During 1992-1999, there were 35,002 deliveries in Rayong Hospital. There were 10 cases of rupture uteri. None of them was a previously scarred uterus. The incidence was 1:3500 deliveries.

### Material and method

Cases of rupture uteri were searched in labour room record books and operating room log

books. Medical record of mothers and babies were reviewed. The accoucheurs who took care of the cases were interviewed personally when available. The data regarding antenatal cares, courses of labour, management of first, second and third stage of labour in addition to patient profiles were collected. The outcome of the mothers and babies were also reviewed and pertinent findings gathered.

### Result

The patient profiles, clinical courses, pertinent findings and treatments are summarized in table 1 and 2. Cases number 1, 8 and 10 are briefly described below.

**Table 1.**

Case	Age	Parity	ANC	First stage [Hrs.]	Second stage [Min.]	Time from delivery to diagnosis [Min.]
1	30	1	Regular ANC at a Private clinic.	6	32	180
2	32	2	Regular ANC at a Private clinic.	5	26	30
3	28	1	Regular ANC at a Private clinic.	6	36	5
4	20	0	Regular ANC at a Private clinic.	8	32	20
5	25	1	Regular ANC at a Private clinic.	5	26	130
6	25	0	Regular ANC at a Private clinic.	4	20	150
7	29	1	Regular ANC at a Private clinic.	7	34	12
8	32	2	Regular ANC at a Private clinic.	6*	—	—
9	39	2	Regular ANC at a Private clinic.	4*	—	—
10	36	2	4 times at a district hospital	Unknown	—	Unknown

\* duration from onset labour pain to operation.

**Case 1.** A 30 years old, G2, P1, was admitted at 40 weeks' gestation because of labour pain. On admission, her cervix was 2 cm. dilated. The uterus contracted every 3-4 minutes of moderate intensity. Artificial rupture of membrane was done. Oxytocin 5 units in 1,000 ml. of 5% dextrose in water was given intravenously. Two hours after rupture of membrane, the cervix was 8cm. dilated. Epidural 0.25% bupivacaine was given. One hour after epidural block, the cervix was fully dilated. With the help of fundal pressure, a 3,350 gm. male baby was born. The APGAR score were 9 and 10 at 1 and 5 minute. Methergine was given after delivery of the placenta. Her immediate postpartum period was essentially normal. Two hour later, she had neither pain nor her vital signs changed. She was transferred to the postpartum ward where she took her meal. After the

meal, she had intense lower abdominal pain and her blood pressure dropped to 70/30 mmHg. Vaginal bleeding appeared normal. Hematocrit was 22 %. Her abdomen was distended and markedly tender on palpation. After initial resuscitation, exploratory laparotomy was done. One liter of blood was seen in the abdominal cavity. The uterus was ruptured transversely at lower segment. TAH was done. Her postoperative period was uneventful and she was discharged on 7<sup>th</sup> postoperative day.

**Case 8.** A 32 years old, G3P2, 40 weeks' gestation was admitted to the hospital because of labour pain. Her previous children was born vaginally. Her second child birthweight was 4,000 gm. Her antenatal care was normal including a normal glucose tolerance test. On admission her cervix was 4 cm. dilated and membrane ruptured spontaneously. The contraction

**Table 2.**

Case	Oxytocin Use	Analgesia, anesthesia	Signs and symptoms	Management of Second stage	Fetal weight	APGAR Score	Treatment
1	yes	Epidural block.	Abdominal Pain, distension,tenderness.	Fundal pressure.	3350	10,10	TAH
2	yes	Epidural block.	Distended abdomen, vaginal bleeding.	Fundal pressure.	3650	9,10	TAH
3	yes	Epidural block.	Distended abdomen, hypotension .	VE+Fundal pressure.	3200	8,10	TAH
4	yes	Epidural block.	Blurred conscious, distended abdomen, hypotension,	FE	2650	9,10	TAH
5	yes	Epidural block.	Hypotension, vaginal bleeding,shock.	VE+Fundal pressure	2950	6,9	Repair.
6	yes	Epidural block.	Abdominal distention tenderness. Dyspnea.	VE+Fundal pressure.	3100	7,9	Repair.
7	yes	midazolam, propanidid	Blurred conscious, hypotension, distended abdomen.	Fundal pressure.	3100	10,10	TAH
8	yes	Epidural block.	Fetal distress, Bandl's ring.	C/S	4450	10,10	Repair.
9	yes	Epidural block.	Fetal distress, Bandl's ring.	C/S	2700	9,10	TAH
10	Unknown	Unknown	Shock,dead fetus, abdominal distention,tenderness.	Failed VE, exploratory laparotomy.	2950	0	Subtotal Hysterectomy, death

VE = Vacuum extraction .FE = Forceps extraction TAH .= Total abdominal hysterectomy C/S= Caesarean section.

was every 4 minutes of moderate intensity. Augmentation with oxytocin was given. Because of intense pain,epidural bupivacaine was administered. The labour became protracted. Two hours after epidural block, irregular fetal heart sound was detected and a Bandl's ring was seen when she was rushed to the operating room. The uterus was found to be partially ruptured transversely at lower segment. Two hundred milliliters of free blood was in peritoneal cavity. A living baby weighing 4,450 gm. was delivered through the rent and the rent was repaired. Tubal ligation was done on the patient's request. She was discharged on 5<sup>th</sup> postoperative day.

**Case 10.** A 36 years old, G3P2, 40 weeks'

gestation, was referred from a district hospital because failed vacuum, suspicious uterine rupture and dead fetus in utero. On admission, she was drowsy and complained of severe abdominal pain and dyspnea. Her blood pressure was 80/40 mmHg. Her pulse was 52/minute, and respiratory rate was 30/minute. Her abdomen was distended and exquisitely tender. One unit of whole blood was given and exploratory laparotomy was performed immediately. The operative findings were 3,000 ml. of blood and clots in peritoneal cavity. The lower segment was torn obliquely upward from right to left. Left uterine vessels were torn and bleeding was active. Fetal arm and shoulder were extruded into abdominal cavity through the rent. The

dead fetus along with placenta were removed. Repair of the rupture site was attempted but failed. Subtotal hysterectomy was done. The operation was compounded by cardiac arrest and coagulopathy. Massive transfusion and cardiac resuscitation was done. It took 175 minutes to finish the operation. She was then move to intensive care unit where she was treated for shock and anuria. Nine hours after the first operation, she was brought back to the operating room because of internal bleeding. The finding was 2000 ml. of blood in the abdomen and bleeding from surgical wound could not be stopped. A large swap was left in the peritoneal cavity to compress active bleeding. Abdomen was closed. The patient never recovered and pronounced dead 6 hours after the second operation.

As shown in the TABLE 1&2, The ages of the patients ranged from 20-39 years. The parity were 0-2. All attended reasonably good ANC and had spontaneous labour pain at term. The range of first and second stage [first 7 cases] were 4-8 hrs and 20-36 mins respectively. The babies weight were 2650-4450 gm. The duration from delivery to diagnosis varied from 5 to 180 minutes. The signs and symptoms of uterine rupture were abdominal pain, tenderness, distension, vaginal bleeding and hypotension or shock. Fetal distress was detected in case 8 and 9.

These patients could be categorized into 3 groups, they are group [1] case 1-case 7, group [2] case 8 and 9 and group [3] which is case 10.

All cases of group [1] shared a lot of common clinical features. They were all private patients, were given oxytocin augmentation, were given either heavy sedation with propanidid [Epontal] and midazolam [Dormicum] or epidural bupivacaine. The duration of effective sedation of propanidid and midazolam was too short for normal second stage of labour. In order to shorten the second stage of labour, vigorous fundal pressure was applied with or without vacuum extraction. In those who received epidural block. The urge to push disappear and, again, second stage were managed in the same manner. Only one baby [case 4] showed sign of mild asphyxia. The only reason that could

explain was that the rent took place just before or at the end of second stage. No maternal death occurred in this group. The morbidity were either subtotal or total hysterectomy. Two cases were treated by repair of the lesion.

The second group was case 8 and 9. Both of them were gravida 3 para 2 whose previously deliveries were normal. They were given oxytocin augmentation, and were diagnosed as having threatened uterine rupture. The most likely explanation was hyperstimulation and hyperdistention in case 8. After caesarean section was done, the uterus was found to be ruptured partially in case 8 and completely in case 9. The outcome of babies were good as they had good APGAR scores and the mothers survived without any sequels.

All 9 cases had occurred before September 19th, 1997 when the meeting was held and the obstetricians were agree to avoid the dangerous interventions. Propanidid had been banned from our unit since early 1993. Epidural bupivacaine was a standard practice for private patient that contributed nearly 50% of all deliveries in our unit. No rupture of uterus had happened till September, 1999 when case 10 was referred to Rayong Hospital. It was a real tragedy. She was a labour. Her first two children were born in two different provinces. She had 4 ANC visits at a district hospital. She went to the district hospital because of labour pain. For unknown reason, vacuum extraction was done despite the fact that the baby was only 2,950 gm. Either malpresentation or fetal distress was the best guess. Failed vacuum extraction led to transferring her to another district hospital that she was referred to Rayong Hospital too late to save her life despite massive blood replacement and intensive care postoperatively.

## Discussion

The incidence of rupture uteri varies from 1:18500 and 1:16849 in developed world<sup>(1,2)</sup> to 1:200 in Lagos, Nigeria.<sup>(3)</sup> The most common cause was scar rupture.<sup>(1-6)</sup> During 1992-1999, ten rupture uteri were treated in Rayong Hospital. The incidence is 1:3500

deliveries. In contrast to most reports, none of cases was scarred uterus. It is a common practice for us to do repeat caesarean section for all previous section or scarred uterus. The vaginal birth after caesarean section [VBAC] is more popular in the developed country as the recommendation of the American College of Obstetrics and Gynecology for one or even two previous transverse section [1994,1995]. At present, VBAC was not practiced on regular basis in any hospital in our country. Most of the pregnant scarred uterus are subject to caesarean section before they are in labour. During the period of 1992-1999, all rupture uteri in Rayong hospital were unscarred uterus. All of them should have been preventable. In group 1, the use of anesthesia or heavy sedation was a common practice for private patients. To shorten second stage, vacuum or forceps extraction and fundal pressure were used inadvertently. Three vacuum extractions were combined with fundal pressure. Improper use of vacuum or forceps extraction and fundal pressure are known as common causes of traumatic rupture.<sup>(1-3,5,6)</sup>

The anesthesia masked some cardinal signs such as abdominal pain and tenderness. In case 1, detection was delayed as long as 6 hrs after delivery. Heavy sedation also caused blurred consciousness and made it difficult to detect the ruptures. While service patients received only morphine and promethazine as a routine analgesia. There was no uterine rupture in these patients. To augment labour, oxytocin was given, rarely was misoprostol used. Oxytocin was believed to be a culprit in causing rupture uteri.<sup>(1,3,4,6,7,10)</sup> In September 1997, when the meeting was held in the obstetric unit and the matter discussed, the obstetricians agree to the cautious use of oxytocic drugs and avoid using vigorous fundal pressure to shorten second stage. No more rupture of this type had occurred.

For cases 8 and 9, epidural anesthesia made the patient painless and consequently oxytocin was administered carelessly. In addition to oxytocin, large baby sizes in case 8 was probably responsible for the rupture.<sup>(1,2,4)</sup> Application of oxytocic drugs should be monitored closely. Early detection of threatened uterine rupture and prompt action saved the babies' and

mothers' lives. The treatment was usually total or subtotal hysterectomy. Three out of ten cases were treated by repair of the wound. In most instance, the location and extent of rupture determine if it could be repaired. The rent that is transverse and in lower segment should be repaired successfully. Some reported 70% of ruptures could be repaired.<sup>(3)</sup> If fertility is to be preserved, repair should be attempted provided the condition of the patient is good enough to tolerate the lengthy operation.

The last case was somewhat more complex. It should not have happened in these days. The management at two district Hospitals were unclear and involved a poor referral system. When it happened, it means that the supervised persons should improve the health team, referral system and training of the health personels.

In conclusion, there were ten cases of uterine ruptures during 1992-1999 in Rayong Hospital. None of them had previous scar, was grand multiparous or had poor ANC. Seven out of ten shared distinct clinical features from what we had known. The injudicious use of anesthesia, analgesia, oxytocin and vigorous fundal pressure were believed to be the main causes of rupture uteri in Rayong Hospital. Proper management of second stage and maximum caution on using instrument deliveries should have prevented most of the uterine ruptures. Early detection of the threatened rupture and rupture uteri are mandatory to save lives of mothers and babies. Repair of rupture should be done in selected cases. Good referral system and good team are deemed necessary to handle catastrophic rupture uteri.

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