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Case Report and Review of the Literature

Spontaneous Rupture of an Unscarred Uterus in the Second Stage of Labour: A Case Report and Review of Literature

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ABSTRACT

Background: Uterine rupture is a rare, but severe pregnancy complication. It is mostly associated with history of uterine surgery, especially previous cesarean section but can rarely occur in unscarred uterus. Diagnosing this condition in the absence of uterine scar requires a high degree of suspicion and fetal heart tracing abnormalities remain the most common symptom.

Case Report: 21-year-old G2P1 was admitted in latent labour. Pitocin was used for augmentation. Fetal heart tracing was in category I except an episode of bradycardia accompanied by uterine tachysystole that was resolved by resuscitative measures and turning off Pitocin. Later in the labour course, the FHT showed recurrent late and variable decelerations, cervix was found to be fully dilated at the time. Pushing was started and following a prolong deceleration, cesarean section was performed that showed a uterine rupture in the posterior wall of uterus.

Conclusion: Although rare, uterine rupture should be considered as a diagnosis even in the absence of uterine scar as the main risk factor.

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Introduction

Uterine rupture is a rare but serious pregnancy complication that can be life-threatening to both mother and fetus. It is mostly associated with scarred uterus, especially with previous cesarean delivery. Although rare, uterine rupture, can also occur in unscarred uterus. The rupture of both scarred and unscarred uterus has increased in recent years. Risk factors associated with uterine rupture include usage of uterotonics, high number of parity, uterine anomalies, advanced maternal age, dystocia, macrosomia, multiple gestations, abnormal placentation, and previous uterus surgeries especially previous cesarean section. Symptoms of uterine rupture include severe abdominal pain, vaginal bleeding, and signs of fetal distress including non-reassuring fetal heart tones, maternal hemodynamic instability such as maternal hypotension and tachycardia, and loss of fetal station. However, diagnosis can be challenging.

Uterine rupture not only can endanger a woman's life, but also can affect her fertility in future [1]. Outcomes of uterine rupture, includes post-partum hemorrhage, maternal transfusion or hysterectomy, neonatal transfer to NICU, and maternal and neonatal death [2]. Our aim in this study is to represent a case of spontaneous uterus rupture in an unscarred uterus as well as conducting a systematic review of literature to identify risk factors and symptoms related to this condition and providing useful information regarding diagnosis of uterus rupture.

Case Report

21 years old female G2P1001 at 39 6/7 weeks was admitted to Labour and delivery unit in latent labour. She had no history of past medical illness or any history of gynaecological surgeries. On admission, her fetal heart tracing was in category I with baseline in 140s and Tocogram showed contractions every 3-4 minutes apart. Patient was started on

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Pitocin for augmentation of labour. During her labour, fetal heart tracing showed an episode of fetal bradycardia lasting for approximately five minutes, accompanied by uterine tachysystole which were resolved by maternal oxygenation, repositioning, and discontinuation of Pitocin. Subsequently, FHT returned to category 1. Membranes were then artificially ruptured that showed clear fluid followed by bloody show and passage of small clots. Pitocin was restarted for augmentation and fetal heart tracing remained in category 1 for approximately seven hours until the next morning. Fetal heart tracing subsequently started to be in category 2 with recurrent variable and late decelerations. Pitocin dose was then reduced, and cervix was re-examined and was found to be 10/100/0. FHR remained in category 2. Patient was put in higher fowler position to allow passive descent of fetus. Pushing was started after an hour and fetal station remained at 0. While pushing, fetal heart tracing showed a prolonged deceleration to 90s lasting for four minutes.

At this time decision was made to proceed with cesarean section. While mobilizing the team to OR, fetal heart tracing dropped to 50s. Following Pfannenstiel incision and entering peritoneal cavity, fetal head was felt in the abdominal cavity outside of uterus. Uterine rupture was noted and fetus was delivered with APGARS 0, 1, 1. Placenta was delivered without difficulty. Uterus was inspected and uterine rupture was noted at the left side from lower uterine segment to fundus. The left broad ligament was noted to be opened by rupture and left ureter was exposed and easily visible. Rupture was noted to continue to left side of cervix. Rupture was repaired and hemostasis was reached. Mother was stable

after surgery and recovery was uneventful. Fetus was transferred to higher level facility but died shortly after.

Literature Review and Discussion

I Literature Review

A systematic search for unscarred uterine rupture was performed using PubMed database. Inclusion criteria were uterine rupture in the 3rd trimester with no history of prior uterine scar. Exclusion criteria were placental abnormalities, cases related to abdominal trauma, home birth attempt, history of previous uterine manipulation and surgery, VBAC, post-partum cases of uterus rupture, and non-English language studies. After applying exclusion criteria, our search yielded eight cases of unscarred uterine rupture. The most common risk factor identified in these cases, was usage of Pitocin for augmentation of labour (6 cases reported augmentation with Pitocin). The most common sign was fetal heart tracing abnormalities (all 8 studies reported episodes of at least category 2 or bradycardia), followed by abdominal pain that was present in five cases. The outcome of uterine rupture is significant. Four deliveries were complicated by fetal demise or severe outcome such as severe neurologic deficit due to asphyxia. Six Cases resulted in post-partum hemorrhage and two out of eight cases resulted in hysterectomy. Maternal parameters, risk factors, signs and symptoms, and outcome are summarized in (Table 1).

Table 1: Maternal characteristics, labour details and prenatal outcomes of the reviewed cases.

Author/year	Cai [3]	Halassy [4]	Wael [5]	Chang [6]	Bank [7]	Matsuo [8]	Matsuo [8]	Val-canzarite [9]
Maternal age	40	40	23		34	39	39	30
G	7	5	1	2	5	5	3	1
P	3	4	0	1	1	3	2	0
GA	37	36	36	41	41	39	38	40
Use of Induction	Yes, via Cervidil	Yes, via Cytotec, Foley bulb	no	Yes, via Cytotec	no	no	Yes, via Cytotec	no
Use of Pitocin for augmentation	yes	yes	no	yes	yes	no	yes	yes
FHR abnormality	Yes	yes	yes	yes	yes	yes	yes	yes
Abdominal pain	No	yes	yes	yes	yes	yes	yes	
Vaginal bleeding	Yes	no						
Maternal underlying disease	Yes, psoriatic arthritis	no	no	no	no	no	no	no
Other risk factors	Glucocorticoid use	ECV	no	no	no	no	no	no
Fetal APGARS	5, 9		1, 3, 4			9, 9	2, 6, 9	0, 3, 6
Fetal weight			2637	3584		3632	2956	4150
EBL	1500	massive	1200	2000	3000	500	1600	
Outcome of delivery	Favourable mother and fetal outcome	Hysterectomy in mother	Favourable mother and fetal outcome	Severe fetal outcome	Severe fetal outcome	Favourable mother and fetal outcome	Hysterectomy in mother, favourable fetal outcome	Severe fetal outcome

II Discussion

Diagnosing uterine rupture in the absence of uterus scar can be very challenging for obstetricians and requires a high degree of suspicion in the absence of history of previous cesarean section as the main risk

factor. One of the symptoms of uterus rupture is change in the pattern of uterine contractions. Vlemminx *et al.*, categorized uterus contraction patterns associated with uterine rupture into four categories: hyper stimulation, decrease in uterine activity, increasing baseline and no change in uterine activity [10]. Matsuo *et al.*, introduced a new sign in

tocogram of unscarred uterus rupture, “Staircase” sign that is a stepwise gradual decrease in uterine contractions [8]. These contraction patterns can best be identified by IUPC, and external monitoring may show only 44% of what can be shown by internal monitoring. Dorthe *et al.*, suggested that epidural anaesthesia and use of oxytocin is significantly related to uterine rupture in unscarred uterus [11].

In our case, we had an episode of uterine tachysystole at the beginning of augmentation that was accompanied by fetal bradycardia and late decelerations and were resolved with turning off the Pitocin. Pitocin was restarted after an hour and Tocogram did not show any more tachysystole episodes or any other changes in uterine activity. Bank *et al.*, reported a similar case, in which uterine rupture occurred in a patient with unscarred uterus. In their case, cervix was fully dilated, and fetal station remained at 0, and C-section was performed 30 minutes after fetal bradycardia. Fetal weight was 4500 gm, and they suggested a prolonged labour associated with fetopelvic disproportion and oxytocin use was related to incidence of uterine rupture.

In general, fetal heart rate changes remain the most common clinical manifestation of uterine rupture. Other symptoms include loss of station, abdominal pain, vaginal bleeding, and changes in uterus contraction pattern. Due to the rare nature of these events, very few studies have been done and the exact cause of rupture in the absence of uterine scar is unclear, while the impact is very severe. We recommend further studies to evaluate causes of uterine rupture in unscarred uterus.

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