Introduction

Ruptured uterus is a potentially catastrophic event in which the integrity of the myometrial wall is breached. It can be of two types, incomplete and complete. Spontaneous rupture in primigravida is a rare event. Incidence of rupture in the unscarred uterus is about 1 in 17,000–20,000 deliveries,\[1\] while that in the scarred uterus is 5.1 per 10,000 deliveries.\[2\] The rate of maternal death from uterine rupture is 0–1% in developed nations, but in developing countries, it is 5–10%.\[3\] Here is a case series including four rare cases of uterine rupture in an unscarred uterus of primigravida, which was seen over a span of three years (2018–2021) at Rajendra Institute Of Medical Sciences, Ranchi, the tertiary care institute in the state of Jharkhand, India. The aim behind reporting this case series is to sensitize the family physicians and health care workers that rupture of the uterus can occur even in unscarred primigravida patients.

Case 1

A 22-year primigravida with 30 weeks pregnancy was referred from a private hospital and admitted to the emergency obstetric ward of our institute at 1:00 pm on 02.03.2020 with complaints of intermittent pain abdomen for one hour. She had two ANC visits at CHC and was immunized and investigated. On admission, she was normotensive, afebrile with mild pallor. On obstetrical examination, fundal height was corresponding to 28–30 wk size; the uterus was relaxed with a cephalic presentation, the head was 5/5 palpable, FHR 146/min, on per vaginal examination, her modified Bishop’s score was 4. In view of prematurity and Bishop’s score, injection dexamethasone and tocolysis were started, but her uterine contractions increased in frequency and duration. She delivered an alive/preterm/lethargic female baby of 1.2 kg at 4:00 pm and shifted to NICU after resuscitation. Active management of third stage of labour (AMTSL) was done, but there was atonic postpartum hemorrhage (PPH), which could not be controlled even after stepwise management of PPH. Her vitals deteriorated with BP 80/60 mmHg, PR: 128/min. Resuscitation with crystalloids and blood was done, and the patient was shifted to the OT for exploration. Cervix and vaginal wall were found to be normal on exploration, but profuse bleeding was still there.

Keywords: Primigravida, ruptured uterus, unscarred uterus

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A balloon tamponade was inserted, but the uterus remained atonic. The patient's condition kept on deteriorating, and she became severely pale, so the decision of laparotomy was taken. Under G/A, abdomen opened, B/L uterine artery ligation was done. Utero-vesicle fold was separated in order to proceed for compression suturing, which showed a rent of around 5 cm in the lower segment of the uterus, which was actively bleeding [Figure 1]. Rent was repaired, compression sutures were given, but the uterus remained flabby. Thus the decision for hysterectomy was taken as a life-saving procedure, and after informed consent, subtotal hysterectomy was done. PRBC, FFP, and platelets (3 units of each) were transfused. The patient was kept in Obstetric HDU and was discharged on day 10 in stable condition with postoperative Hb being 9.2 g/dl. The baby was in NICU at the time of discharge.

**Case 2**

A 26-year primigravida, term pregnancy, unbooked case with no ANC visits, admitted in our obstetric emergency on 08.12.2020 at 11:30 pm referred from CHC for obstructed labor. She had a history of intermittent pain abdomen for more than 24 hours. There was also the history of inserting some medication vaginally by an untrained birth attendant at around 1:00 pm on the day of admission. At around 8:00 pm, the birth attendant informed the patient's relatives that the head was jammed and the delivery could not be conducted at home, so she was taken to CHC, from where she was referred to a higher center. On her way to the hospital her pain subsided. On admission, the patient was conscious, oriented but perspiring; her BP was 80/40 mmHg, PR: 138/min, low volume, SP02: 94% at room air, RR: 24, with severe pallor, as per abdominal examination distension present, uterine contour could not be assessed, superficial fetal parts felt, FHR was absent, tenderness present, as per vaginal examination, dry hot vagina, cervix fully dilated, fully effaced, membrane absent, head at 0' station, caput +++, moulding +++, B/L Ischial spine was prominent, B/L pelvic walls were convergent. USG confirmed a ruptured uterus and hemoperitoneum. After resuscitation, she was taken to the OT. Under G/A, laparotomy was done, and a fresh stillbirth female baby of 3.5 kg was taken out from the peritoneal cavity with a jammed head deep in the pelvis. The lower segment was ruptured and extended up to the round ligament of the left side [Figure 2]. The uterine repair was done, approximately 1500 ml blood and clots removed, abdominal lavage done, and intraperitoneal drain inserted. 2 units each of PRBC, FFP, and platelets were transfused, post-op Hb was 9 g%. The post-operative period was uneventful except for some minor morbidities (indwelling catheter kept for two weeks), and the patient was discharged on day 14.

**Case 3**

A 23-year P1 + 0, day 1 puerperium was referred from CHC and admitted to the emergency ward on 07.07.2019 at 9:00 pm with uncontrolled PPH. She had forceps delivery of a fresh stillbirth male baby of 3.5 kg at 6:12 pm at CHC. On examination, the patient was conscious and oriented, her underclothes were soaked with fresh blood. She had marked pallor, PR: 132 bpm, low volume, BP 90/70 mmHg, SP02: 98% at room air, RR: 20. Uterine fundus was at the level of the umbilicus, well contracted, the contour was maintained, as per-vaginal examination, there were two intravaginal packs which were soaked with fresh blood with ongoing bleeding. After resuscitation and sample collection for cross-matching and investigations patient was shifted to the OT for genital exploration. On examination under anesthesia, multiple vaginal lacerations, a tear on the anterior lip of the cervix, and fullness in the anterior fornix were found. Tear and lacerations were repaired, but the bleeding was not controlled. The patient’s condition was deteriorating, BP: 80/60 mmHg, PR: 144/min feeble, she became severely pale, so the decision of laparotomy was taken. On laparotomy, intraperitoneal blood collection was found, uterus was well contracted with bulging of utero-vesical fold of the peritoneum. After separating bladder peritoneum, and removing blood clots, a rent of around 3 cm in the lower segment was visualized [Figure 3], which was repaired. 2 units of PRBC, FFP, and platelet were transfused, post-operative period was uneventful with Hb being 8.8 g/dl and the patient was discharged on Day 8 after stitch removal.

![Figure 1](image1.png) **Figure 1:** Intra op picture showing rent in the lower segment with a flabby uterus

![Figure 2](image2.png) **Figure 2:** Intra op picture of a ruptured lower segment extending up to the left lateral wall
Intra op picture showing rent behind UV fold

Case 4
A 25-year old woman, primigravida with 37 weeks 5 days pregnancy, was admitted at 12:30 pm on 02.03.2018. The patient had 4 ANC visits at CHC, was immunized, and investigated. Her reports were within normal limit, including USG done at 24 weeks. On 02.03.18 at 2:00 am, she developed intermittent pain in the abdomen of moderate intensity with bleeding per vagina. The patient was admitted to CHC for further management but at 9:30 am, she was referred to a higher center in view of the nonprogress of labor and continuous bleeding per vagina. On history taking, attendants informed that her pain was subsided on the way to the hospital, and the patient was restless. On examination, the patient had marked pallor, BP and pulse were not recordable, on per abdominal examination uterine contour was not made out, superficial fetal part palpable, FHS not localized, per speculum examination shown bleeding coming through os, per vaginal examination-os 6–7 cm dilated, cervix high up to head station high up membrane absent, and pelvis was adequate. On USG, cardiac activity was absent with the baby lying outside the uterus in the abdominal cavity with an intraperitoneal collection. After resuscitation and collection of samples for grouping and cross-matching, the patient was shifted to the OT. Under general anesthesia, laparotomy was done, there was massive hemoperitoneum, a stillborn male baby of 2.25 kg lying in the abdominal cavity with retroplacental clots of around 300 cc. A T-shape rupture was present in the anterior uterine wall. Ruptured uterus repair was done. Peritoneal toileting was done, and abdominal drain was inserted. Three units of PRBC and Four units of FFP were transfused on day 1 post-operative. She was kept on a ventilator for one day then extubated. The patient recovered and was discharged on day 10.

Discussion
Ruptured uterus in primigravida (unscarred uterus) is an extremely rare event. Its association with precipitate labor, obstructed labor, instrumental delivery, and placental abruption makes it one of the rarest.

Any case of precipitate labor has a high risk of atonic as well as traumatic PPH, as seen in Case 1. Thus, in intractable postpartum bleeding, genital exploration is mandatory to rule out any uterine trauma or rent. In the literature search, we could hardly find any case of ruptured uterus associated with precipitate labor in primigravida, but a case reported by Ozeraityte A et al.[6] shows spontaneous uterine rupture in a healthy 28-year-old primigravid woman at the 31st gestational week. The woman was hospitalized due to contractions, which eased after rest. Later she had acute abdominal pain followed by an emergency cesarean section in which they found longitudinal posterior uterine wall rupture. She had no known risk factors explaining the rupture.

In Case 2 obstructed labor in an unscarred primigravida uterus can also lead to uterine rupture especially if associated with injudicious use of oxytocic drugs, so early referral and diagnosis of obstruction can prevent a catastrophic outcome. Vernekar M et al.[7] in their retrospective analysis of 13 cases of unscarred ruptured uterus had found oxytocic to be associated with three cases (23.1%), but patients in their case series were multigravida.

Instrumental delivery, if not done at a well-equipped hospital by a trained person, can also lead to serious genital or uterine trauma, as seen in Case 3. Although there are extremely less reported cases, a case reported by Faria J et al.[8] uterine rupture was diagnosed in the puerperium after a vacuum extraction (VE). In this instance, no risk factors were found apart from the use of VE in the setting of prolonged deceleration.

As we see in Case 4, if a patient presents with antepartum hemorrhage with severe pain, early diagnosis and management of abruption should be done, and serious and rare complications like uterine rupture should also be kept in mind. Mourad et al.[9] 2015 also suggested in their case report that an idiopathic spontaneous uterine rupture can occur in an unscarred uterus of a primigravida in association with a placental abruption, especially in case of pre eclampsia.

The most common cause for ruptured uterus is previous uterine surgery, with maximum cases occurring in women with previous cesarean section. Schrinsky and Benson found that 32% of women who had unscarred uterine rupture were multipara.[10] In a recent review by Ucella and Colleague in 2011, 24 cases of prelabour uterine rupture in primigravida were identified over the previous 60 years, of which 23 cases have specific clinical data available, 16 cases had h/o of previous uterine surgery or instrumentation, which were mainly myomectomies. Other risk factors were uterine anomalies, uterine curettage, uterine diverticula, malpresentation, chronic corticosteroid use, cocaine abuse, direct or indirect uterine trauma, placenta percreta, increta, adenomyosis, fibroid uterus, external uterine maneuver, collagen matrix disorder as Ehlers–Danlos syndrome (type 4).[11] But here in this case series, we had discussed the unscarred uterine rupture in primigravida without any known risk factors.

Proper antenatal care is important for each and every patient. Institutional delivery should be promoted, and instrumental
delivery should be conducted at a well-equipped hospital. Health care personnel working at PHC and CHC should not ignore the confusing symptoms of pain in the abdomen and unexplained vaginal bleeding, even in primigravida patients. High suspicion for genital injury, including ruptured uterus, should be kept in mind. This case series will help the obstetricians in early diagnoses and timely management of ruptured uterus, which will further help in reducing maternal mortality and morbidity.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) have given her consent for her images and other clinical informations to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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