

# Traumatic Uterine and Bladder Rupture due to Instrumental Vaginal Delivery by Vacuum: A Case Report

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## ABSTRACT

Uterine rupture is a very rare but critical obstetrical complication that requires prompt diagnosis and treatment. It is a major complication of instrumental delivery due to lack of skilled personnel and inadequate monitoring in the intrapartum period of delivery. Here, authors present a case report of a 30-year-old woman, who presented to the hospital with complaints of acute abdominal pain, per vaginal bleeding and leakage of urine following vacuum assisted vaginal delivery. This led to traumatic postpartum haemorrhage that required further surgical evaluation and management. Retrospective analysis of such cases give us an idea of the problems that still exist with instrumental deliveries and the importance of labour surveillance during the 2<sup>nd</sup> stage of labour. Traumatic uterine and bladder rupture following vacuum delivery is a preventable cause of postpartum haemorrhage. Timely recognition of the condition can reduce the maternal morbidity and mortality.

**Keywords:** Assisted delivery, Macrosomia, Obstructed labour, Postpartum haemorrhage, Uterine trauma, Ventouse delivery

## CASE REPORT

A 30-year-old para four, living four was referred to the institute with the complaints of abdominal pain, per vaginal bleeding and leakage of urine since one day following her delivery. Patient gave history of having a difficult prolonged labour one day back at a private hospital in her hometown. The patient had delivered a live healthy male baby weighing 4000 grams by a vacuum assisted vaginal delivery (only vacuum was used, no forceps assistance). Following the delivery, she initially complained of inability to pass urine. Catheterisation was done and minimal blood-stained urine was noticed. Subsequently, she began to develop abdominal pain and associated per vaginal bleeding with leakage of urine from the vaginal opening. Her obstetric history revealed that all her four deliveries were full term vaginal deliveries which had resulted in live healthy babies. She was then referred to a tertiary care centre for further management.

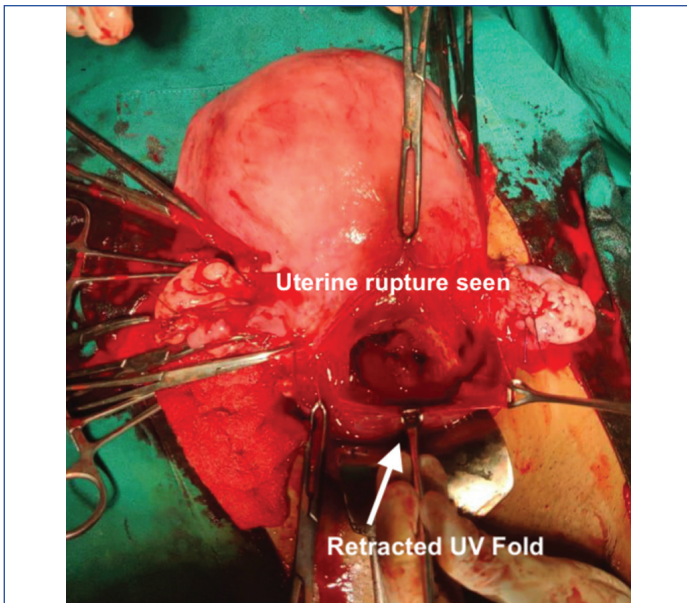
On presentation to the hospital, patient was conscious and afebrile. Her vitals were stable with a normal pulse rate of 72 beats per minute (bpm) and a blood pressure of 110/70 mmHg. On physical examination pallor was present. Abdominal examination revealed a non distended abdomen with tenderness over the suprapubic region. Per speculum examination revealed a cervical tear at the 11'o clock position extending upwards. The upper limit of the tear could not be made out, suggesting that the cervical tear had extended into the uterine cavity. Anteriorly, a vaginal tear was present and urine was found draining into the vagina. A healthy episiotomy wound was seen in the posterior vaginal wall. Per vaginal examination revealed a defect in the posterior bladder wall. A Foley's catheter was introduced into the urethra and the foleys bulb was inflated. The Foley's bulb was visualised through the anterior vaginal wall, confirming the diagnosis of ruptured bladder. Patient's laboratory results revealed a haemoglobin of 8.7 gm/dL and total White Blood Cell (WBC) count of 16,360 cells/cumm. Renal function tests and coagulation profile were normal.

A provisional diagnosis of ruptured uterus with ruptured bladder was made. Patient and her relatives were explained about her condition and consent was taken for emergency laparotomy. The possibility for a hysterectomy was also explained to both patient and her relatives. Arrangements for surgery were made, adequate blood was reserved and preoperative antibiotics were given.

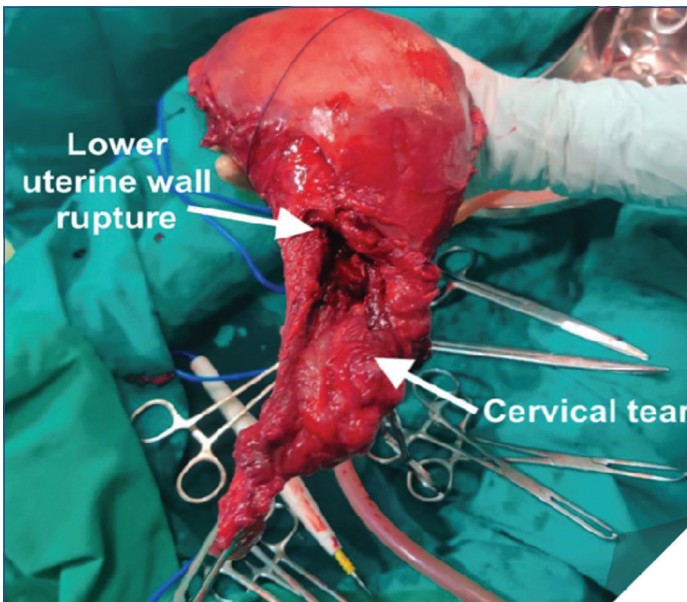
Exploratory laparotomy was done and the diagnosis of uterine rupture and bladder rupture were confirmed. A total abdominal hysterectomy and bladder rent repair was performed by a team consisting of obstetricians, urologists and anaesthesiologists. Under general anaesthesia, the abdomen was opened with a pfannenstiel incision and the uterus was exteriorised. Uterovesical fold was opened, revealing a cervical tear in the anterior lip of the cervix extending superiorly into the lower uterine segment and inferiorly into the vagina [Table/Fig-1]. The extent of the damage was so severe that the cervical tear extended down into the anterior vaginal fornix with the presence of continuous bleeding along the margins [Table/Fig-2]. Afterwards, a total abdominal hysterectomy was done and the anterior vaginal wall was sutured with intermittent sutures. The vault was then closed. The urology team inspected the bladder. A defect of 4 cm in the posterior wall of the bladder in the trigone region, more towards the right ureteric orifice was noted [Table/Fig-3]. Left ureteric orifice was oedematous. Stenting of ureters was done and position confirmed with C-arm. The bladder wall defect was sutured in two layers using polyglactin 910 and suturing it with continuous interlocking sutures [Table/Fig-4]. Leak test was done with methylene blue dye and absence of leak was confirmed. Omentum was then placed between the bladder wall and vault to prevent the reformation of fistulas. Suprapubic catheter was placed in the bladder. Per urethral Foleys catheterisation was continued. Pelvic corrugated drains were placed in the perivesical space. Skin incision was closed in layers. Postoperative period was uneventful. Suprapubic catheter was removed after 15 days and preurethral catheter by 21 days. Ureteric stents were removed after three months. Patient condition was satisfactory on follow-up.

## DISCUSSION

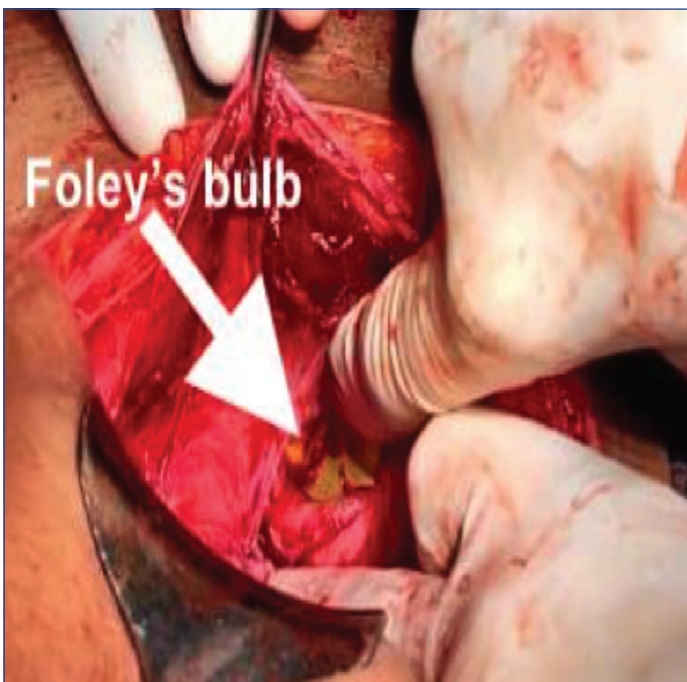
There has been a significant decrease in the maternal mortality ratio in developed countries in recent decades. However, developing countries still suffer from a large number of maternal deaths. Very often, pregnancy itself is a risky event in a woman's life. Around the world, up to 585,000 women pass away from complications arising in pregnancy and during childbirth. Upto 70% of these complications include haemorrhage, sepsis, abortion, preeclampsia, eclampsia and obstructed labour [1].



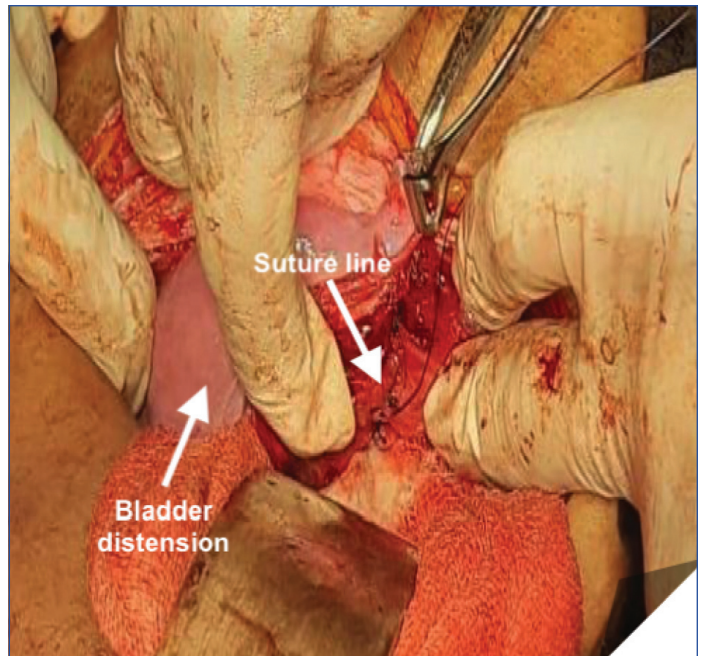
[Table/Fig-1]: Anterior uterine wall rupture visualised after cutting open uterovesical fold.



[Table/Fig-2]: Extension of anterior uterine rupture into cervix and anterior vaginal wall.



[Table/Fig-3]: Foley's bulb visible through posterior bladder wall in the trigone region.



[Table/Fig-4]: Stenting of ureters and bladder wall repair was done using two layers of sutures.

Prolonged and obstructed labour is one of the most common preventable causes of maternal and perinatal morbidities. Cases of obstructed labour can be complicated by uterine rupture, an obstetrical emergency that compromises the health of the mother and baby. Uterine rupture is defined as a breach in the normal integrity of the uterine myometrium. It can be further classified into complete and incomplete. An incomplete uterine rupture is one in which the visceral peritoneum is intact, whereas a complete uterine rupture is when there is spillage of the uterine contents into and around the peritoneal cavity [2]. Predisposing conditions for rupture of the uterus are caesarean section scar, obstructed labour, use of prostaglandin and oxytocin [3]. Rupture is also associated with instrumental delivery with forceps and vacuum [4]. The condition itself is rarely seen in present day scenarios, with an occurrence of around 12 in 36,000 births [5].

Many women with ruptured uterus present with hypovolemic shock, and maternal and perinatal mortality have also known to occur [6,7]. Presence of haematuria following vaginal delivery should make one suspect bladder rupture [8]. The uterus can be managed conservatively or by hysterectomy. Scarred uteri are usually dealt with precaution, as rupture of the uterus is a known and anticipated complication. As seen in the studies conducted by Revicky V et al., and Kumba C et al., [5,9]. In these cases, because of the history of previous caesarean delivery, patients were carefully observed and monitored during the process of labour. Changes in the status of baby or mother immediately prompted them to shift for emergency caesarean delivery. There was no attempt at instrumental delivery as the immediate thought was concerning uterine rupture, as it is a common complication associated with vaginal birth after caesarean. Unfortunately, an unscarred uterus with a history of prior normal deliveries sometimes may be elusive [10]. The rarity of index case was the presence of uterine rupture in a multiparous women with previously all vaginal births. The incidence of uterine rupture in this type of patient is even less, it is estimated to be around 1 in 8000 to 1 in 15000 deliveries [11].

In a study conducted in Ethiopia, 17.3% of the uterine ruptures were associated with assisted instrumental deliveries, 77.1% were associated with vacuum and 22.9% associated with forceps delivery [12]. Inappropriate use of the vacuum can lead to uterine rupture. Application of the vacuum on an unengaged head, in an incompletely dilated cervix, prolonged traction without progress, lack of proper control and in cases of prolonged or obstructed labour have been associated with uterine rupture [13].

There is also substantial evidence that instrumental deliveries increase maternal morbidity as a result of other complications such as perineal pain at delivery, perineal lacerations, formation of haematomas, and long term problems such as urinary and fecal incontinence [14]. This reinforces the necessity for obstetricians who are well trained in instrumental delivery to be of service during the progress of labour and importantly during the 2<sup>nd</sup> stage of labour. Along with skillful training in the use of ventouse or forceps, there is a need for careful selection of the cases for application, this is of paramount importance. A case report by Nasare P et al., demonstrated a similar case where progress of labour was arrested and the patient required the assistance of forceps for delivery of the baby. Very much like index case, the patient's labour progression arrested in 2<sup>nd</sup> stage of labour and prior history of the progress of labour was not well understood. Possibility of inadequate monitoring might have played a role. Likewise, this patient was also multipara with previously uneventful vaginal deliveries. Shortly after her delivery, she began to complain of pain in abdomen and breathlessness which upon further investigations done in a tertiary care hospital, was found to be most likely uterine rupture [2].

Application of instruments for delivery such as vacuum or forceps should be done with caution in labour cases and one should have keen clinical acumen to diagnose the complications associated with it as well as carefully monitor the progression of labour to prevent them from arising. This preventable obstetrical emergency is especially seen in association with deliveries conducted in rural areas. Lack of finances and proper resources in remote areas eventually leads to unskilled delivery, higher incidence of obstructed labour and subsequent development of life threatening uterine rupture. Those who manage to survive the effects might be left to deal with associated long term complications such as fistula formation or psychological trauma [15].

The key to prevention of uterine rupture is in early antenatal detection of anticipated maternal complications, such as mal presentations of foetus or abnormal maternal pelvic architecture. It also reinstates the importance of choosing institutional deliveries over home births and the importance of intrant surveillance and detection of dysfunctional labour to prevent injury to the uterus or surrounding structures.

## CONCLUSION(S)

Ruptured uterus and bladder injury during instrumental vaginal delivery is a preventable obstetric hazard and early diagnosis and treatment of it can reduce maternal morbidity and mortality.

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