Spontaneous Bladder Rupture after Normal Vaginal Delivery

Subjects: Allergy

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Spontaneous bladder rupture during labor or postpartum is an extremely rare condition. Increased visceral pressure, weakening of the bladder, and vesical catheterization performed during labor are predisposing factors.

Keywords: bladder rupture ; spontaneous ; vaginal delivery

1. Introduction

An increased intraperitoneal pressure intrapartum and postpartum has been reported to cause bladder rupture. Signs and onset symptoms typically consist of ascites and acute abdominal pain. Irritation due to urine following intraperitoneal rupture may result in peritonitis or sepsis [1]. Patients may complain of suprapubic pain, anuria, and hematuria; in rare cases, intraperitoneal bladder rupture may not be associated with abdominal pain and urine may be passed without any symptoms, and so the diagnosis of intraperitoneal rupture may be difficult in these situations. The contextual finding of elevated serum urea and creatinine should raise the possibility of bladder rupture [2]. Some reports have noticed pseudo-renal failure because of creatinine diffusion into the circulation [3].

Surgery is crucial for the resolution of the clinical picture and consists of urine removal from the peritoneal cavity and closing of the rupture [4].

This complication represents a surgical emergency, and a rapid diagnosis represents a challenge for gynecologists.

2. Spontaneous Bladder Rupture after Normal Vaginal Delivery

New onset ascites with acute abdomen in puerperium is a very rare condition and the differential diagnosis may be hard for the physician. Several causes of puerperal ascites have been described in the literature, all with a clinical picture similar to that of the spontaneous rupture of the bladder. One case of postpartum hepatic artery thrombosis has been described by Damman et al. in a patient presenting with fever, coma, ascites, ileus, jaundice and renal failure after delivery [5]. The impaired liver function suggested the hepatic origin of the clinical pictures. Gyang et al. reported the case of a missed diagnosis of acute postpartum pancreatitis in a patient showing abdominal pain, pyrexia, anemia and gross ascites a few days after instrumental delivery [6]. Bowel perforation is an uncommon complication that generally occurs during gestation and the most frequent locations are the rectum and sigma. This type of complication is generally linked to the presence of endometriosis infiltrating the intestinal wall. Acute pelvic and abdominal pain, diarrhea and fever are the typical symptoms [7]. Another cause of acute abdominal pain and abdominal effusion in the puerperium may also be the rupture of an ovarian cyst or ovarian torsion [8]. In these cases, a timely ultrasound approach may guide the diagnostic process.

Spontaneous rupture of urinary bladder (SRUB) following spontaneous vaginal delivery is an extremely rare condition and represents a surgical emergency. The few data in the literature do not help us to fully clarify the causes of this adverse event. It is usually described in association with recent trauma, malignant diseases, anatomical outflow obstructions, indwelling catheters, instrumentation, neurogenic bladder or a combination of these [2]. Despite the low incidence and non-specific symptomatology, diagnosis is often delayed and associated with a high mortality rate [9]. It emerged that the predominant clinical signs are abdominal pain and tenderness. Intraperitoneal fluid accumulation may cause intestinal and peritoneal irritations and urological symptoms, such as anuria [10]. Some authors reported cases characterized by signs of acute renal failure secondary to systemic absorption of urea and creatinine [11]. Serum chemistry abnormalities could be seen only after 24 h: creatinine, urea and potassium levels may be elevated, while sodium and chloride concentrations may be low [11][12][13]. Dysuria and hematuria were less frequently observed, which could mean that urological etiologies are misled, with delayed or missed diagnosis [14]. The history of urinary retention and the sudden relief or increase of pain,

accompanied by small amounts of infected or blood-stained urine, is associated with a higher possibility of bladder rupture. In these cases, cystourethrography is regarded as the procedure of choice. Some authors suggested to use non-IV contrast CT in conjunction with retrograde cystourethrography, looking for intraperitoneal extravasation of contrast. This provides the benefit of cross-sectional images and the ability to distend the bladder in order to detect small perforations, avoiding contrast nephrotoxicity [15]. The aetiology of this condition is multifactorial. Urinary retention is not uncommon in the post-partum period. The epidural block proved to increase three times the risk of urinary retention. Other recognized risk factors are the use of systemic narcotics, perineal laceration, instrumental delivery and epidural analgesia during labor [15][14].

Another cause of bladder rupture is represented by the sustained pressure of the fetal head against the intraperitoneal portion of the bladder during forceful uterine contractions, provoking necrosis of the bladder dome. This is more likely if the patient is not catheterized, resulting in a distended bladder during labor. Other contributory factors include the presence of a pre-existing bladder diverticulum, prolonged second stage and high birth weight babies [15]. Not only may bladder damage occur during labor due to the lack of catheterization but also due to inadequate catheterization. Few cases of rupture after urinary catheterization without other predisposing factors have been described in the literature [16]. Four of these happened during labor vesical catheterization. Considering the morphology of the vesical lesion diagnosed in our and in other patients during-labor catheterization, this procedure may represent a risk factor for bladder rupture. When impromptu catheterization is performed inadequately, with thin catheters and excessive exertion of pressure, bladder damage may be caused [17]. In the final stages of labor, it is necessary to be careful during extemporaneous catheterization. Exerting an opposite force to that of uterine contractions and the fetal head can be responsible for the ischemic events in the bladder wall.

To prevent this kind of complication it would be better to use catheters of not too thin a gauge and avoid deep introduction of the catheter into the bladder in the final phase of labor.

There are some reports about concomitant bladder and uterine ruptures. In addition to cystograms, some authors suggested that intravenous contrast-enhanced CT is at least as sensitive as cystography [18]. In fact, while considering nephrotoxicity of contrast-enhanced CT, the need to have an accurate diagnosis in a critically ill patient must be taken into account. Management differs between intra- and retroperitoneal rupture. Early diagnosis and prompt surgical treatment decreases the morbidity and mortality associated with this condition [4].

Retroperitoneal bladder rupture is commonly treated with bladder catheterization for 10 days. The classical treatment for intraperitoneal bladder rupture is surgical repair and urinary rest [16].

Muggia et al. managed this rare condition by percutaneous ascites drainage and long-lasting foley. However, the report described a case with small iatrogenic injuries. Large tears caused by blunt trauma clearly should be managed surgically [19].

Corriere et al. suggested strict criteria for conservative management of small intraperitoneal bladder perforation, including absence of infection, no bowel herniation, diagnosis within 12 h from the injury, no concurrent intrabdominal injuries and absence of ascites [13][20]. Operative treatment consists of urine removal from the peritoneal cavity, closing the rupture and instituting good vesical emptying [21][4].

3. Conclusions

Gynecologists must be aware of bladder rupture after spontaneous delivery—a rare but insidious occurrence. Abdominal pain and blood tests indicating kidney failure should suggest the presence of this complication. Firstly, an abdominal ultrasound evaluation should be performed. In case of an inconclusive ultrasound result, a patient still hemodynamically stable and with abdominal free fluid should undergo a computerized tomography. If this doesn't enable a decisive diagnosis, cystourethrography is the gold standard to identify bladder perforation. The therapeutic choice depends on the type of bladder rupture. Retroperitoneal rupture is commonly treated with bladder catheterization. The classical management for intraperitoneal rupture of the bladder is surgical repair and urinary rest. In the literature, all cases have been treated by laparotomic approach. However, laparoscopy is a possible and effective alternative as a diagnostic tool, the performance of which must take into consideration the patient's condition and the operators' experience. A quick diagnosis and an adequate surgical approach are crucial for the resolution of this rare complication.

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