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Case Report

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A Rare Case of Anterior Urinary Bladder Wall Avulsion and Proximal Urethral Tear Following Spontaneous Vaginal Delivery

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Introduction

Substantial injuries to the maternal lower urinary tract during vaginal delivery are rare. In a review of 270,000 ICD-9 coding records between 1979 and 2006 in the United States, Frankman and colleagues reported the rate of bladder or urethral injury to be 10.3 per 1000 women for spontaneous vaginal delivery (SVD) and 4.8 per 1000 women with operative vaginal delivery (OVD). This was attributed mostly to the high frequency of simple peri-urethral laceration at vaginal delivery as opposed to actual bladder injuries [1].

Cases of bladder rupture following vaginal delivery are exceedingly rare. In most instances reported, there was a concomitant uterine rupture during a trial of labor after cesarean (TOLAC) or following a successful vaginal birth after delivery (VBAC) [2,3]. In the few cases where a bladder rupture has occurred in isolation, the rupture was intraperitoneal, presented acutely during the puerperium, and required surgical repair by way of laparotomy [4-7].

Case Details

We report a case of an extra-peritoneal urinary bladder wall avulsion and proximal urethral tear in a healthy primiparous female diagnosed immediately following a spontaneous vaginal delivery.

A 38 year old healthy primigravida presented to the obstetric ER with regular contractions at 39+6 weeks' gestation. Her pregnancy course was normal. Surgical history revealed an open appendectomy at the age of three, and a subsequent laparotomy at age nine following a small bowel obstruction, most probably secondary to the previous appendectomy. On digital examination she was 1.5cm dilated with a Bishop score of, with irregular contractions [6].

During her time in the obstetric E.R she progressed rapidly and entered the second stage of labor within 3 hours. She was then transferred to the delivery room, and gave birth soon after without regional analgesia. Notably, no catheterization of the bladder was performed before delivery. Birth weight was 2925 gr. Fetal presentation was left occiput anterior (LOA). Spontaneous expulsion of the placenta in its entirety ensued after 13 minutes, without excessive hemorrhage.

Post-partum, vaginal examination in the delivery room revealed no vaginal or perineal lacerations, but a proximal urethral tear was suspected. (Figure 1).

Figure 1: Suspected urethral tear post-partum

The patient was taken to the operating room, where the on-call urologist inserted a 14F urinary catheter under general anesthesia. A proximal urethral longitudinal tear at 12:00 o'clock was confirmed, involving the external urethral sphincter (EUS) and the anterior wall of the bladder. The overall length of the tear was approximately 8 centimeters, of which 4 centimeters involved the bladder mucosa (figure 1).

Hemostasis was initially achieved at the site of the clitoral crurae using Vicryl 3-0 sutures. Surgical closure of the anterior bladder wall and anatomical approximation of the EUS and urethral tear

edges was performed in two layers using Vicryl 3-0 sutures, with the 14f catheter as a guide (figure 2).

Figure 2: Surgical repair in the O.R

An intra-operative retrograde Methylene Blue instillation test was negative. Antibiotic prophylaxis with Cefuroxime IV was administered and a urinary culture sample was obtained.

Post-Operative Course

After a brief recovery in the post-anesthesia care unit (PACU), the patient was admitted to the maternity ward. The urinary catheter was not removed during the entirety of the hospitalization in order to facilitate healing, with adequate urine output recorded daily and no evidence of retention. Gross hematuria persisted for approximately 12 hours post-operatively. The post-operative course was significant for episodic painful bladder spasms followed by urine leakage around the urinary catheter, which were partially alleviated by administering an anti-cholinergic agent (Oxtbutynin HCL 5 mg daily). The patient also experienced chronic dysuria and was thus started on Phenazopyridine Hydrochloride (100 mg X3 daily), which achieved adequate pain control. Substantial urethral edema was noted, with complete resolution prior to discharge.

The patient was discharged 12 days after delivery with the urinary catheter still in place, planned for removal 14 days after delivery. Blood loss manifested as symptomatic anemia with hemoglobin levels dropping by 2 gr/dl, requiring an IV iron infusion (Venofer 200mg). Urinary culture was negative. Patient returned for check-up in the Urological Department 14 days after delivery, where the catheter was removed.

Discussion

Severe injury to the lower maternal urinary tract during normal vaginal delivery is a rare occurrence. Previously identified risk factors are a history of prior caesarian section, operative vaginal delivery, augmentation of labor and deep vaginal tears during labor, all of which were absent in our patient [7-11]. For example, one retrospective study by Kattan and colleagues described a series of 7 such cases over a two-year time period in two separate medical centers, which includes documented injuries to the urethra, rupture of the bladder neck and posterior bladder wall and bladder contusion.

Regarding the underlying mechanism of injury in our patient, a main point to consider is whether the injury originated in the bladder and extended into the EUS and the urethra, or vice versa. If the injury vector originated in the bladder, a leading possibility is increased bilateral pressure against an over - distended bladder causing avulsion which then extended distally. Due to the precipitated course of labor, the bladder may have been rapidly impacted between the contracting uterus and fetal head posteriorly and the maternal pubis anteriorly. Blunt mechanisms account for over 50% of all bladder injuries in the general population, with motor vehicle accidents being the most common mechanism (87.3%) [12,13]. Indeed, the risk of rupture during blunt injury increases with bladder distention [14]. The fact that the injury in our case did not extend from the anterior vaginal wall supports this mechanism.

Extra - peritoneal bladder ruptures, as well as female urethral injuries, are almost exclusively associated with pelvic fractures. When isolated bladder or urethral injury does occur without pelvic involvement they are almost exclusively iatrogenic in nature [12]. Therefore the possibility of unwitnessed iatrogenic damage to the urethra extending proximally into the bladder wall, sometime during the peripartum course, cannot be excluded. Alternatively, the precipitous nature of the delivery might have caused a similar urethral tear. Precipitate labor has been shown to be associated with higher rates of perineal tears, cervical tears, and postpartum hemorrhage, however in this case the injury was not continuous to any such tears [15].

Another possibility is that damage to the bladder or adjacent structures from one of the patients' prior abdominal surgeries may have been exacerbated during delivery, however no such cases have ever been reported. Finally, rare underlying conditions such as a genitourinary anatomical variant, or a connective tissue disorder causing inherent weakness of relevant supporting structures should also be considered, although none such factors were established in our patient.

We conclude that bladder wall rupture during spontaneous vaginal delivery is an exceedingly rare occurrence, typically associated with a concomitant uterine rupture during TOLAC or after VBAC. Our case may indicate that a precipitated course of labor is an additional risk factor for bladder rupture, either as a primary bladder injury or secondary to a deep urethral tear. It is recommended to consider active drainage of the bladder during the second stage of labor, in selected cases of natural delivery with no epidural anesthesia.

References

1. Frankman EA, Wang L, Bunker Clareann (2010) Lower urinary tract injury in women in the United States, Am J Obstet Gynecol 202: 495. e1-5.
2. Lua LL, EvansT, Gomez N (2017) Simultaneous Uterine and Bladder Rupture Following
   a. Successful Vaginal Birth after Cesarean Delivery: Laparoscopic Repair of
   b. Defect. J Minim Invasive Gynecol 24: 329-332.
3. Klutke JJ KC (1992) Simultaneous bladder and uterine rupture at the time of attempted vaginal birth. Int Urogynecol J 3: 83-86.
4. Baheti VH, Wagaskar VG, Patwardahn (2015) Missed Iatrogenic Bladder Rupture Following Normal Vaginal Delivery. J Clin Diagn Res 9: 1-2.
5. Farhazadi AMS (2016) A Late Presentation of Spontaneous Bladder Rupture During Labor. Urol Case Rep 8: 24-25.
6. Roberts C, Oligbo N, Sinwhoe J (1996) Spontaneous bladder rupture following normal vaginal delivery: a postpartum emergency. Br J Obstet Gynaecol 103: 381-382.
7. Png KS, Chong YL, Ng CK (2008) Two cases of intraperitoneal bladder rupture following vaginal delivery. Singapore Med J 49: 327-329.

8. Kattan S (1997) Maternal urological injuries associated with vaginal deliveries: change of pattern. Int Urol Nephron 29: 155-161.
9. Klotz T, Derakhshani P, Vorreuther R (1998) complete urethral rupture with symphysis injury and anterior pelvic ring fracture during spontaneous delivery. Urologe A 37: 79-82.
10. OnuoraVC, Ariyan R, Koko AH (1997) Major injuries to the urinary tract in association with childbirth. East Afr Med J 74: 523-526.
11. Zeteroğlu S BH (2005) combined bladder, urethral and uterine rupture after a normal, spontaneous vaginal delivery at home: a case report. J Reprod Med 50: 874-876.
12. B Phillips, S Holzmer, L Turco, Mirzaie M, Mause E et al (2017) Trauma to the bladder and ureter: a review of diagnosis, management, and prognosis. Eur J Trauma Emerg Surg 43: 763-773.
13. Pereira BM, De Campos CC, Calderan TR, Reis LO, Fraga GP (2013) Bladder injuries after external trauma: 20 years experience report in a population-based cross-sectional view. World J Urol 31: 913-917.
14. Guttmann I KH (2013) Blunt Bladder Injury. Clin Sport Med 32: 239-246.
15. Sheiner E, LevyA, Mazor M (2004) Precipitate labor: higher rates of maternal complications. Eur J Obstet Gynecol Reprod Biol 116: 43-47.