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

Lavie Michael¹*, Ben David Reuven² and Bar-On Shikma¹

¹Department of Obstetrics and Gynecology, Sourasky Medical Center, Lis Maternity Hospital, Tel Aviv University, Tel Aviv, Israel
²Department of Urology, Sourasky Medical Center, Tel Aviv University, Tel Aviv, Israel

*Corresponding author
Lavie Michael, 1Department of Obstetrics and Gynecology, Sourasky Medical Center, Lis Maternity Hospital, Tel Aviv University, Tel Aviv, Israel. E-mail: mickeylavie@gmail.com

Received: November 06, 2019; Accepted: November 11, 2019; Published: December 07, 2019

Introduction
Substantial injuries to the maternal lower urinary tract during vaginal delivery are uncommon. 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) [1]. This was attributed mostly to the high frequency of simple peri-urethral laceration at vaginal delivery as opposed to actual bladder injuries.

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 cesarean 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 due to small bowel obstruction. On digital examination she was 1.5cm dilated with a Bishop score of 6, with irregular contractions.

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).

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.

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

Figure 1: Suspected urethral tear post-partum
Involvement they usually iatrogenic in nature [11]. Therefore, when isolated bladder or urethral injury does occur without pelvic distention [10]. The fact that the injury in our case did not extend from the anterior vaginal wall supports this mechanism.

Indeed, the risk of rupture during blunt injury increases with bladder vehicle accidents being the most common mechanism (47.3%) [9]. Severe injury to the lower maternal urinary tract during normal vaginal delivery is an exceedingly rare occurrence, typically associated with a concomitant uterine rupture during TOLAC or after VBAC. This case report 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.

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. This case report 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.

References
12. Sheiner E, Levy A, Mazor M (2004) Precipitate labor: higher rates of perineal tears, cervical tears, and postpartum hemorrhage, however in this case the injury was not continuous to any such tears [12].

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 to our knowledge no such cases have 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.

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 (Oxybutynin HCL 5 mg daily). The patient also experienced chronic dysuria and was thus started on Phenazopyridine Hydrochloride (100 mg X 3 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. 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 [8].

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 (47.3%) [9]. Indeed, the risk of rupture during blunt injury increases with bladder distention [10]. 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 usually iatrogenic in nature [11]. 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 precipitious 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 [12].

Copyright: ©2019 Lavie Michael. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.