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Urethral Diverticulum Presenting as a Large Vaginal Mass Complicating Pregnancy and Delivery

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Female, 25
Final Diagnosis: Urethral diverticulum
Symptoms: Large anterior vaginal mass
Medication: —
Clinical Procedure: Primary cesarean section
Specialty: Obstetrics and Gynecology

Objective: Unusual presentation

Background: A case report of urethral diverticulum complicating pregnancy is presented. The diagnosis and management are challenging because of the rare nature of this condition, the varied presentations and differential diagnoses, and the possibility of misdiagnosis.

Case Report: A 25-year-old primigravida with scheduled induction of labor at 39 weeks gestation due to gestational diabetes mellitus presented for a routine antenatal appointment at 38 weeks and four days. On digital cervical examination, she was found to have a large semi-solid anterior vaginal mass, shown by trans-vaginal ultrasound to have a nearly solid appearance of a 5×7 cm mass with septation. Maternal Fetal Medicine and Gynecologic Oncology consultations were obtained primary cesarean section with vaginal biopsy in the Operating Room were recommended. Following an uncomplicated cesarean delivery and with the patient still under spinal anesthesia, the anterior vaginal mass was examined and found to contain 200 ml of purulent material. Because a diagnosis of urethral diverticulum was made, a biopsy was not performed. The patient was placed on antibiotic prophylaxis for the remainder of her hospital course. Follow-up CT scan confirmed a large urethral diverticulum, and she was referred to the Fetal Pelvic Medicine and Reconstructive Surgery (FPMRS) and Urogynecology units for treatment.

Conclusions: Early identification of urethral diverticulum during the pregnancy may allow for treatment and a trial of labor with vaginal delivery. MRI is the recommended imaging modality in identifying urethral diverticulum.

MeSH Keywords: Diabetes, Gestational • Diverticulum • Pregnancy Complications

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Background

Urethral diverticulum is an uncommon condition in the general gynecological population and even more rare in the pregnant population. A urethral diverticulum is a localized herniation of urethral mucosa into surrounding tissues with a prevalence in the population ranging from 0.6–6% in women of reproductive age [1]. Acquired diverticula are thought to originate from repeated urinary tract infections obstructing the periurethral glands, which can then rupture into the urethral lumen creating local herniation [2]. Another accepted theory suggests that a urethral diverticulum originates from an obstructed periurethral gland that becomes infected, forming an abscess that evenly ruptures into the urethral lumen, forming an ostium [3]. Urethral diverticula during pregnancy should be managed conservatively with expectant management, antibiotics, aspiration, and incision and drainage if necessary [3]. Most patients with urethral diverticulum present with vague urinary symptoms or pelvic pain and have often been refractory to previous treatments, at times leading to a delay in diagnosis.

We report a case of a patient who first presented in her third trimester of pregnancy with a large anterior vaginal mass, diagnosed as urethral diverticulum that affected the mode of delivery, resulting in cesarean section. The diagnosis and management of urethral diverticulum in pregnancy are challenging because of the rare nature of this condition, the varied presentations and differential diagnoses, and the possibility of misdiagnosis.

Case Report

A 25-year-old primigravida woman presented for her initial prenatal visit at ten weeks and three days gestation. She had a past medical history of chronic hypertension, hidradenitis suppurativa, and morbid obesity. Her physical examination, including a pelvic examination, were reported as normal and she had a uterine size consistent with a ten-week gestation pregnancy. Previously, she had been treated for a urinary tract infection at six-weeks gestation, following a urinalysis done in the emergency department, which revealed moderate numbers of red blood cells and a positive leukocyte esterase test.

At the 18-week antenatal visit, the patient was again noted to have moderate numbers of red blood cells by urine dipstick analysis and was again treated for a urinary tract infection and urine culture was also obtained. At her 27-week antenatal visit, a three-hour oral glucose tolerance test supported a diagnosis of gestational diabetes. At this time, she complained of dysuria her urine dipstick analysis again demonstrated the presence of red blood cells. A urine sample was sent for culture, which resulted in a mixed bacterial flora. At her 33-week antenatal

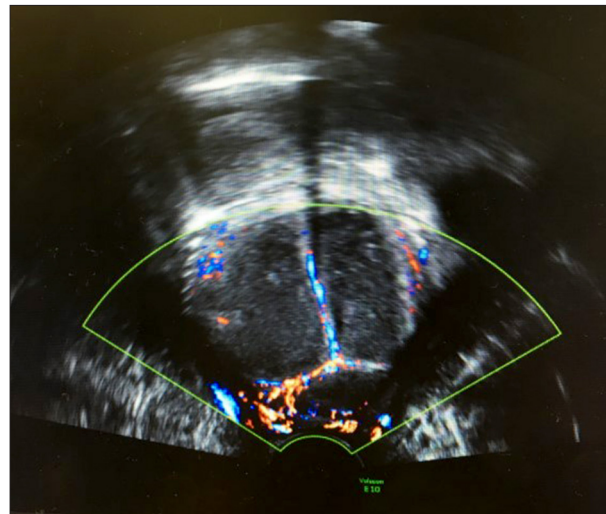


Figure 1. Pelvic and urethral ultrasound (US) scan. Ultrasound shows a solid, septated 5×5×4.2 cm mass distending the anterior vaginal wall and distorting the endocervical canal. The rim of the mass was vascular, and the mass was septated.

visit, the patient continued to demonstrate blood in her urine. A plan was discussed for a urology consultation in the postpartum period, to evaluate the reason for the microscopic hematuria and recurrent urinary tract infections.

A third-trimester ultrasound was notable for an estimated fetal weight (EFW) of 79%, and a fetal abdominal circumference of 90%. No vaginal masses were seen on ultrasound. At 38-weeks and four days gestation, the patient presented for a routine fetal non-stress test (NST) and management of her gestational diabetes. Her cervix was examined due to planned induction within three days, which was found to be closed, thick and high. However, at this time the patient was noted to have a large semi-solid anterior vaginal wall mass that was felt to be separate from the urethra. Due to its size and taut cystic nature, a transvaginal ultrasound was performed to characterize the mass. The differential diagnoses at this time included vaginal cyst, vaginal fibroid, or vaginal malignancy. The ultrasound report documented a solid septated mass distending the anterior vaginal wall and distorting the endocervical canal. The mass was 5×5×4.2 cm, the rim of the mass was vascular, and the mass was septated (Figure 1). The etiology of the mass was uncertain. Patient evaluation by the Gynecologic Oncology team was recommended prior to labor induction.

The patient was admitted to the Labor and Delivery Unit at 39 weeks of gestation for delivery due to chronic hypertension and gestational diabetes. After discussion with staff in the Maternal Fetal Medicine unit regarding the risk of fetal shoulder dystocia in a diabetic mother with a fetal abdominal circumference in 90% and large vaginal mass, the recommendation was to



Figure 2. Follow-up pelvic computed tomography (CT) scan. Follow-up computed tomography (CT) scan shows a 27.8×17.8 mm urethral diverticulum.

proceed with delivery via cesarean section. After consultation with the Gynecologic Oncology team and review of the images, they also agreed with delivery via cesarean section with core needle biopsy of the vaginal mass in the operating room immediately after the cesarean delivery. The patient underwent spinal anesthesia, and her abdomen and vagina were prepped with betadine. She subsequently delivered a viable female infant from vertex presentation. The infant had Appearance, Pulse, Grimace, Activity, and Respiration (APGAR) scores of 7 and 8 and a weight of 4,020 g. Normal postpartum uterus, Fallopian tubes, and ovaries were identified. On vaginal inspection, the mass was grasped in order to perform a biopsy, and purulent fluid was observed to be draining from the urethra around the Foley catheter, suggesting a diagnosis of either an urethral diverticulum or an abscess. Postoperatively, the patient was placed on intravenous (IV) antibiotics.

The immediate postpartum course was uncomplicated for both the mother and the neonate, and she was discharged home with plans for a postoperative appointment and referral to Urogynecology. She presented to triage approximately two weeks postoperatively with vaginal pain and microscopic hematuria. The anterior vaginal wall mass was still present and measured about 2×4×2 cm. She underwent a CT scan of the abdomen and pelvis and a vaginal mass was identified, which confirmed the diagnosis of a urethral diverticulum. (Figure 2) The patient was then referred to the Female Pelvic Medicine and Reconstructive Surgery and Urogynecology units for definitive treatment, following MRI for further assessment of the urethral diverticular mass (Figure 3).

Discussion

A case report of urethral diverticulum complicating pregnancy is presented. The diagnosis and management are challenging because of the rare nature of this condition, the varied



Figure 3. Follow-up pelvic magnetic resonance imaging (MRI). Follow-up magnetic resonance imaging (MRI) shows a 28.3×13.9 mm urethral diverticulum in the posterior wall of the urethra.

presentations and differential diagnoses, and the possibility of misdiagnosis. To identify previous case reports or clinical studies on the diagnosis and management of urethral diverticulum in pregnancy, a literature search was undertaken using the search terms “urethral diverticulum” AND “pregnancy.” The search engines used were PubMed, CINAHL, and Web of Science, with no limits on the years searched, but with the search limited to articles published in the English language. Three publications were identified that supported this case report [1,2,4]

Urethral diverticula have rarely been reported in pregnancy with only six cases previously reported in the literature. One case from 2013 [2] demonstrated an instance of a urethral diverticulum, in which the patient underwent a diverticulectomy, and delivery via cesarean section to decrease the risk of fistula formation from previous incision site along the anterior vagina. No other adverse outcomes were described and the patient’s pain and discomfort resolved.

In a review of four cases of urethral diverticula in pregnancy, published in 1998, all of the cases described presented with a variety of presenting symptoms, and a variety of diagnostic techniques to identify the diverticula, and a variety of management strategies [4]. The clinical presentations included a para-urethral mass, urinary incontinence, symptoms of cystitis, urinary tract infection, urethral pain and discharge, and voiding difficulty. The imaging modalities varied from transvaginal ultrasound to cystoscopy to postpartum voiding cysto-urethrogram.

Management strategies included antibiotics, diverticulum aspiration, and incision and drainage. Delivery was by the vaginal route in two women who received diverticulum aspiration, and via cesarean section in the other two cases, for unrelated indications. Three of the women underwent urethral diverticulectomy following pregnancy

In our case, persistent microscopic hematuria with mixed flora on urine cultures for urinary tract infection was suggestive of a urinary tract abnormality and warranted further investigation. The work-up of lower urinary tract symptoms, including hematuria, may result in the diagnosis of other rare genitourinary findings, such as an intraurethral bladder tumor, which is only observed in 1% of all bladder tumors [5].

In this case report, the only pelvic examinations were the initial ones done at ten weeks and the one done at 38+4 weeks when the mass was first identified. An initial ultrasound for fetal anatomy was done at 20+6 weeks and at 29+1 weeks to complete the fetal anatomic survey, and neither identified a vaginal mass. Two additional ultrasounds done for fetal growth at 33+4 weeks and at 36+4 weeks were also reported as normal. The pelvic examination that identified the enlarged anterior vaginal wall mass was done at 38+4 weeks and suggested a vaginal cyst, fibroid, or tumor. But when a transvaginal ultrasound was done just after the pelvic examination, it showed a vascular, septated mass. Magnetic resonance imaging (MRI) at an earlier stage could potentially have provided an earlier diagnosis of urethral diverticulum. Transvaginal

and transperineal sonography also have the ability to differentiate between a cystic and solid mass, are easy to use, and have a lower cost. However, it may be difficult to differentiate urethral diverticulum from other etiologies [6]. The ability of an MRI to identify such characteristics as size, multiplicity, relationship to the urethra, and intraluminal complexity assists in the planning of the surgical procedure, which is likely to reduce surgical morbidity [6]. If imaging is available and the diagnosis is made, consultation with the Female Pelvic Medicine and Reconstructive Surgery, Urogynecology, or Urology units would be warranted for possible antepartum evaluation on an individual case basis, for possible aspiration for attempted vaginal delivery.

Conclusions

Urethral diverticulum is an uncommon condition in the general gynecological population and even more rare in the pregnant population. A case report of urethral diverticulum complicating pregnancy is presented. The diagnosis and management of urethral diverticulum in pregnancy are challenging because of the rare nature of this condition, the varied presentations and differential diagnoses, and the possibility of misdiagnosis. Early identification of urethral diverticulum during pregnancy may allow for possible aspiration and trial of labor with the anticipation of a vaginal delivery. Urethral diverticula during pregnancy should be managed conservatively, and MRI is the recommended imaging modality to make an accurate diagnosis.

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