Invasive nonbilharzial squamous cell carcinoma of the bladder in pregnancy

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Section: Genital (female) imaging
Area of Interest: Pelvis Urinary Tract / Bladder
Procedure: Diagnostic procedure
Technique: Ultrasound
Technique: Ultrasound-Colour Doppler
Technique: Ultrasound-Spectral Doppler
Technique: MR
Special Focus: Neoplasia Obstetrics Case Type: Clinical Cases
Authors: Y. N. Chen1, S. Y. Lee 2, R. J. Gratton3, J. L. Chin4, S. E. Pautler4, and W. M. Romano5
Patient: 31 years, female

Clinical History:

31-year-old woman, 21 weeks pregnant, with history of recurrent urinary tract infection.

Imaging Findings:

Repeat ultrasound at our institution showed the foetus in vertex position, with the placenta located anteriorly along the fundus, a few centimetres away from the bladder (Figure 1). A soft-tissue mass measuring 4.5 x 1.9 x 5.3 cm was seen within the bladder lumen, continuous with and arising from the posterior bladder wall (Figure 2). Colour Doppler revealed flow within this mass (Figure 3).

Further evaluation with MRI redemonstrated the bladder mass, which was hypointense on T2-weighted images (Figure 4) and isointense to the bladder wall on T1-weighted images (Figure 5). The mass appeared to be invading the roof of the bladder, with suspected extension through the full thickness of the bladder wall into the perivesical fat. However, there was a very thin fat plane separating this mass from the myometrium of the uterus. Staging with pelvic MRI, abdominal ultrasound, and chest X-ray was negative for metastatic disease.

Discussion:

A. In the developed world, the most common type of bladder cancer is transitional cell carcinoma, accounting for over 90% of cases [1]. The risk of squamous cell carcinoma is increased with chronic bladder irritation (as from recurrent urinary tract infections or indwelling catheters) and Schistosoma haematobium infection. To the best of our knowledge, only two other cases of nonbilharzial (i.e. not related to schistosomiasis) squamous cell carcinoma of the bladder during pregnancy have been described in the English language literature [2, 3].

B. The most common clinical finding of bladder cancer is painless haematuria, either gross or microscopic. 70% of women present with haematuria, which may be mistaken for urolithiasis or vaginal bleeding in pregnancy [1]. Irritative urinary symptoms are the next most common presentation; these may also occur in normal pregnancies and confounding conditions such as urinary infection [1, 4]. More advanced disease may present with symptoms of pelvic or flank pain, ureteral or lymphatic obstruction, or
metastases to the regional lymph nodes, liver, lungs or bones [1].

C. Ultrasound is useful in screening and evaluation of bladder malignancy in pregnancy, as there is no radiation risk to the fetus. Lesions greater than 2 cm can be reliably visualized [2]. Cystoscopy is the main investigation for characterizing bladder lesions; it is generally well tolerated during pregnancy [1]. MRI is used to stage the extent of disease and assess for abdominal and pelvic metastases [5]. In pregnancy, a modified metastatic workup includes chest radiography and a bone scan [1].

D. Low-risk cancers are treated by transurethral resection at any gestational age [6] and followed by cystoscopy. Prognosis is generally good. Intermediate- and high-risk cancers are treated by complete resection, to be followed by repeat resection and intravesical chemotherapy or immunotherapy after delivery, which may be planned sooner with high-risk cancers [7, 8].

Invasive bladder cancer (T2-T4) carries a poorer prognosis. Management is individualized as few such cases are reported in the literature, but includes termination for first and second trimester pregnancies, and Caesarean section with radical cystectomy and urinary diversion after fetal viability at around 28 weeks of gestation for more advanced pregnancies [6]. In our case, the patient also received adjuvant chemotherapy and radiation.

E. In conclusion, although bladder cancer in pregnancy is uncommon, it is important to examine the bladder on prenatal ultrasound to screen for evidence of malignancy, as symptoms may overlap with those of conditions common in normal pregnancy, and a high index of suspicion helps achieve a prompt diagnosis. Delay in treatment directly correlates with a poorer prognosis [5].

**Differential Diagnosis List:** T3N0M0 squamous cell carcinoma of the bladder during pregnancy., Transitional cell carcinoma, Adenocarcinoma

**Final Diagnosis:** T3N0M0 squamous cell carcinoma of the bladder during pregnancy.

**References:**

Description: Sagittal ultrasound of the pelvis demonstrates the fetus in vertex position, with the placenta (arrow) located anteriorly along the fundus, a few centimetres away from the bladder. A mass is seen within the bladder (BL). Origin: Department of Medical Imaging, Schulich School of Medicine & Dentistry, London, Ontario, Canada
Description: Transverse ultrasound of the bladder shows a lobulated mass continuous with and arising from the posterior bladder wall. The uterine myometrium (MYO) is adjacent to the bladder wall, and the fetal head is visible. Origin: Department of Medical Imaging, Schulich School of Medicine & Dentistry, London, Ontario, Canada.
Figure 3

Description: Sagittal colour Doppler ultrasound of the bladder demonstrates vascular flow within the bladder mass. Origin: Department of Medical Imaging, Schulich School of Medicine & Dentistry, London, Ontario, Canada.
Description: T1-weighted image in the same plane as Figure 4 confirms relative isointensity of the bladder mass compared to myometrium on both T2- and T1-weighted images. Origin: Department of Medical Imaging, Schulich School of Medicine & Dentistry, London, Ontario, Canada
Description: T2-weighted image shows the lobulated mass invading the bladder roof (short arrow), with suspected extension into perivesical fat. A thin fat plane appears to separate the bladder mass from uterine myometrium (long arrow). Origin: Department of Medical Imaging, Schulich School of Medicine & Dentistry, London, Ontario, Canada