An Impressive Case of Procidentia with Concomitant Cystocele and Hydronephrosis

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Clinical History: A 45 year old African-American nulligravida female presented to the emergency department complaining of 8/10 nonradiating pain deep within her vagina. The patient admitted to having vaginal pain for the past 5 years, however on the day of admission, her pain had markedly increased from baseline. There is also urinary incontinence associated with coughing and laughing. She had a total hip replacement on the right secondary to a motor vehicle accident 25 years ago. Examination of the pelvis was significant for post surgical changes on the right side, asymmetry of the vulva, and protrusion of the entire uterus beyond the introitus.

Discussion: Pelvic organ prolapse (POP) is a common condition among women, especially in the elderly. By 2030, an estimated over one-fifth of women will be at least 65 years old and be at an increased risk for developing POP.(20,18) POP, though lacks in significant morbidity, and essentially with no mortality (17) and cost an estimated $300 million between 2005 and 2006 for management in the ambulatory care setting.(16) Various studies reported between 2.9 to 8 percent of women experience symptoms as a result of POP. Actual prevalence of women suffering from POP is difficult to calculate due to 1) the varying thresholds studies use in determining symptomatic POP and 2) women who are living with POP symptoms but do not seek medical intervention is likely significant, but remains unknown.(12, 14, 18)

Risk factors for developing pelvic organ prolapse associates with trauma, stress, and weakness to the pelvic floor. Multiple studies have correlated parity, advanced age, high body mass index (BMI), and certain ethnicity to have an increase risk at developing this defect.(9,14, 17,18, 19) The case presented here is a nulliparous young African-American female—whose race correlates with lower risk of developing POP— with no known risks for POP who developed procidentia, or total prolapsed of her uterus through the vaginal introitus, from an unusual etiology. Ultrasound has been used by clinicians to assess patients with pelvic organ prolapsed for over 20 years.(5) In addition to the routine pelvic exam, imaging provides objective and reproducible confirmation to findings from the routine pelvic exam and detects any incidental pathology in the region.(10) Translabial/transperineal ultrasound produces a sagittal view of all 3 compartments within the pelvis, and identifies the descended organ(s) and the extent of defect in a manner that highly correlates with the Pelvic Organ Prolapse Quantification (POP-Q) classification.(4) The standard 2D view illustrates the pubic symphysis anteriorly, the urethra and bladder neck, the vagina, cervix, rectum, and anal canal. A horizontal line extending from the inferiorposterior edge of the pubic symphysis serves as reference to measurements taken at rest and on maximum valsalva.(5)

Similarly, magnetic resonance imaging (MRI) generates a midsaggital view of the pelvis both at rest and with the patient in valsava. Reference on the H line, M line, Organ prolase (HMO) system is based on three anatomical lines relative to the pubic symphysis, the coccyx, and the rectum. A line drawn from the pubic symphysis to the coccyx, pubococcygeal line (PCL), connects with the puborectal line (H line) at the pubic symphysis. The third line—M line—connects the rectal end of the H line and perpendicularly to the PCL forming a ninety degree triangle.(2) Due to its higher resolution, MRI has the added advantage of evaluating pelvic floor relaxation with measurements of pelvic descent (M line ≥2cm) and the levator hiatus (H line ≥6cm).(1)

Defects to the pubocervical fascia and the arcus tendineus fascia are thought to be the cause of central and lateral defects within the anterior compartment respectively.(13) Imaging can be invaluable to a surgeon preoperatively in its ability to visualize true bladder prolapses and the position of the urethra, minimizing the potential for a missed diagnosis as often stress incontinence may be secondary to other pathologies such as urethra hypermotility: a urethral descent of 20-30mm on valsava with ultrasound.(5)
Uterine prolapse is generally detected easily on pelvic exam, however in cases of procidentia such as this case, diagnosis of concomitant prolapses is difficult without the aid of radiographic imaging. Rectal prolapse is the most difficult to identify on physical exam, especially in females with multiple organ prolapses, and inadvertently, they compete for palpable space through the vagina. With imaging, clinicians are able to evaluate the posterior compartment beyond the limits of a simple pelvic exam and differentiate among true rectoceles, perineal hypermotility, and rectal intususception.

Before the advent of 3D ultrasound, MRI was inarguably superior in pelvic imaging anatomical variations in the pelvic floor. Newer ultrasounds now reproduce a similar view of the pelvic floor capable of identifying trauma of the levator and its surrounding fascia. Ultrasound offers the advantage to tilt the axial plane and optimize resolution at the area of interest. Studies on the levator hiatus have began to establish parameters in defining abnormalities in this view. For example, distention greater than 25cm$^2$ on valsava is defined as “ballooning.” However, the utility of this technology has some limitations. Assessments based on the area of levator hiatus distention only associates with anterior compartment prolapse, not the posterior compartment.

An intraabdominal ultrasound was performed during the physical evaluation on this patient, and perhaps a translabial ultrasound would have been appropriate to rule out posterior compartment prolapse. MRI of the pelvis, however, was postponed for the following reasons: interference produced from her metallic femur implant, the study is not found to be superior to clinical examination for detecting anterior and central compartment prolapse, and limited resources available for indigent services. Instead, an IVP was ordered on suspicion of urinary tract pathology secondary to her stress incontinence. About 20.6% of patients with severe POP develop hydronephrosis if left untreated.

IVP findings were significant for mild hydronephrosis of the left kidney secondary to a prolapsed bladder and post surgical repairs consistent with patient’s history of motor vehicle accident. A renal and pelvic CT was subsequently ordered for further investigation into her urinary and pelvic findings.

Hydronephrosis, prolapsed bladder, uterine procidentia and post traumatic pelvic anatomical changes were all confirmed on CT. The urinary tract was patent, suggesting mild obstruction of the left ureter and slow progression to hydronephrosis, allowing this patient to delay treatment for multiple years without suffering permanent renal damage.
Figure 1: IVP
Figure 2: CT Topogram
Figure 3: Axial CT demonstrating left hydronephrosis
Figure 4: Axial CT demonstrating low lying urinary bladder

This patient has previously failed multiple pessary attempts, and therefore, is an excellent candidate for surgical repair. Treatment of stress urinary incontinence with both pessary and sling procedure have proven as effective means in reducing the severity of hydronephrosis in patients with stage 4 POP, with possibility for complete resolution. (15, 21) This patient will likely undergo sling procedure and a concomitant hysterectomy to correct her prolapsed bladder and uterine procidentia respectively.

Prior to discharge, the patient expressed interest for definitive treatment and was subsequently scheduled for an urogynecology evaluation the following day. Due to her unique surgical history and indigent status, it would be resourceful to have urogynecology determine the appropriateness of an MRI for this particular case.

References:

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