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Case Report
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Traumatic Vesicovaginal Fistula following Motor Vehicle Collision

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Abstract

A Vesicovaginal Fistula (VVF) is an abnormal connection between the bladder and vagina and, in developed countries, most frequently arise following gynecologic surgery. A 22-year-old female presented as a level one trauma following a motor vehicle collision. Physical exam revealed lower abdominal seatbelt sign, left hip deformity, and slow active vaginal bleeding. Imaging identified pubic symphysis widening, left hip dislocation, large hepatic laceration, and dependent bladder hyperdensity with a focus of air within the vagina. The patient was taken for exploratory laparotomy. Intraoperative foley catheter placement revealed sanguineous drainage. Digital vaginal exam identified anterior vaginal wall defect, with foley catheter balloon palpable through the defect, confirming VVF. Repair was performed transabdominally with multi-layered closure. VVFs are rare complications of surgical or coital trauma but have not yet been described following blunt traumatic mechanism. High index of suspicion, prompt identification and multidisciplinary management allowed for timely repair and reduced morbidity.

Introduction

A Vesicovaginal Fistula (VVF) is an abnormal connection between the urinary bladder and vagina. Acquired VVFs are rare in developed countries, most frequently resulting following obstetric or gynecologic surgery (>75%), malignancy (3% to 5%) and radiation [1]. VVFs have been described following trauma, either surgical or coital, but to our knowledge, have not yet been described in the literature following blunt traumatic mechanism. Our case report describes a young female involved in a motor vehicle collision who sustained severe traumatic injuries to the pelvis, including a VVF.

Case Presentation

Our patient is a 22-year-old female who presented as a level one trauma following a motor vehicle collision. Physical exam revealed seatbelt sign along the lower abdomen, unstable pelvis, left hip deformity, and slow active vaginal bleeding. Pelvis XR was notable for pubic symphysis separation and left hip dislocation (Figure 1). Focused Assessment with Sonography for Trauma (FAST) exam performed and revealed fluid in the right upper quadrant. Hemodynamic stability permitted pre-operative CT to evaluate for active bleed amenable for angioembolization. CT scan identified large hepatic laceration without active bleed, dependent bladder hyperdensity without notable extravasation on delays, small focus of air within the vagina, and small volume hemoperitoneum in the left pelvis (Figure 2). The patient was taken to the operating room for exploratory laparotomy and upon placement of Foley catheter, there was noted to be sanguineous drainage in the catheter and from the vaginal canal. Operative exploration revealed that the foley balloon was unable to be palpated in the bladder, prompting further rapid evaluation. Digital vaginal exam performed, revealing an anterior vaginal wall defect, identifying the foley catheter balloon through the defect, confirming a large vesicovaginal fistula. Urology and Obstetrics/Gynecology were consulted intraoperatively. Further intraabdominal exploration was performed, revealing a 3 cm defect from the bladder neck to the trigone between the ureteral orifices. Vaginal and vesicovaginal fascia were closed in layers, followed by multi-layer closure of the detrusor muscle and bladder mucosa. Foley catheter would be left in place for four to six weeks with XR cystogram prior to removal. The patient was discharged three weeks later.

Discussion

VVFs are rare in developed countries and most frequently occur secondary to unidentified injury to the bladder during obstetric or gynecologic procedures. These patients, in a typical setting, present postoperatively with symptoms of continuous urinary incontinence, and diagnosis can be

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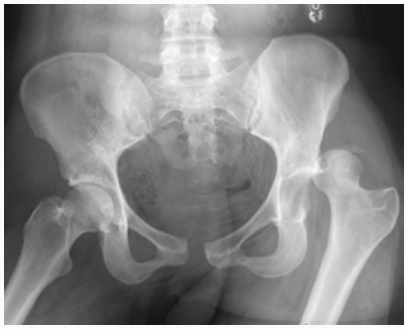

Figure 1: Pelvic XR.

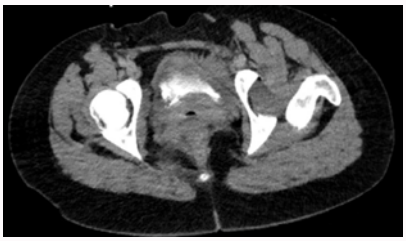

Figure 2: Axial CT Abdomen/Pelvis.

made via speculum or cystoscopic examination, tampon dye test, or CT urogram. In the setting of this patient's presentation, imaging and physical exam were the keys to prompt diagnosis. This patient presented following blunt trauma to the abdomen severe enough to disrupt the pelvic ring and dislocate the left hip. When injuries such as these are identified on the trauma survey, there should be an elevated index of suspicion for urogenital trauma. Injury to the bladder following blunt traumatic injury is relatively uncommon, but approximately 93% to 97% of bladder injuries following trauma present with associated pelvic fractures [2]. Vaginal injury has been described following blunt traumatic mechanism, more frequently due to straddle injury, but approximately 30% have been associated with coexisting injuries to the urologic system [3]. Management of VVFs is determined on size and complexity of the fistula and consists of surgical and non-surgical interventions. For small (<5 mm) VVFs of non-malignant origin, conservative management can be pursued, which includes foley catheter placement for two to eight weeks and anticholinergic medication, which can frequently result in spontaneous closure of the defect. Complex VVFs can be repaired surgically, either transvaginally or transabdominally. Abdominal approach can be accomplished via open incision or by minimally invasive technique (laparoscopic or robotic) and is typically preferred in cases of fistulas located high on the posterior bladder, fistulas with multiple tracts, previously failed vaginal repair, or inaccessibility via vaginal approach. Success rates for abdominal approach range from 85% to 100% [1]. Abdominal approach was utilized in this case due to size and complexity of fistula and ease of access and visualization via midline laparotomy incision. Either surgical approach should ensure to accomplish the tenants of fistula repair, including adequate exposure and tissue mobilization, watertight and tension-free anastomosis, multiple-layer closure, non-overlapping suture lines, and urinary tract drainage [4]. Interposition of pedicled flaps, including omental (gold standard), epiploic, peritoneal, or myofascial, can be utilized in a variety of cases to fill dead space, buffer suture lines, and introduce improved blood supply. To date, there are no randomized studies comparing efficacy of approaches.

Conclusion

This patient presented following blunt traumatic injury and sustained multiple, severe traumatic injuries, including a VVF. In the setting of blunt abdominal trauma with imaging findings revealing significant pelvic injury, a high index of suspicion and meticulous physical exam allowed for expeditious diagnosis. Multidisciplinary approach ensured prompt and satisfactory surgical management of this patient's vesicovaginal fistula and reduced morbidity.

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