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Acute postoperative delayed hemorrhage following anterior colporrhaphy and cystoscopy: A case report and a review of the literature

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ABSTRACT

The development of a retroperitoneal hematoma is a rare complication in gynecologic surgery. The literature on the condition is largely in the form of case reports describing its occurrence in relation to vaginal procedures. We report the case of a 40-year-old woman who had acute delayed-onset postoperative hemorrhage and retroperitoneal hematoma formation following an uncomplicated anterior colporrhaphy. She re-presented to the hospital several hours after discharge, with severe pain and vaginal bleeding. On imaging, she was found to have a large pelvic hematoma that was displacing the uterus, with extraperitoneal free fluid and active contrast extravasation. She underwent resuscitation and successful coil embolization of a small branch of the right uterine artery. This case report adds to the body of literature on the occurrence of retroperitoneal hematoma in vaginal surgery and underscores the importance of maintaining a high index of suspicion in individuals presenting with signs or symptoms suggestive of this diagnosis.

1. Introduction

Surgery for pelvic organ prolapse is common, with studies estimating that 12.6% of women in the United States will undergo surgery for prolapse in their lifetime [1]. As the majority of prolapse repairs are completed vaginally [2,3], understanding the potential risks with this approach is important. Retroperitoneal hematoma is a rare complication in obstetrics and gynecology (Ob/Gyn) that carries the risk of serious morbidity and mortality [4–9]. Although it is challenging to determine a true incidence with vaginal procedures or trauma, significant hemorrhage following minor vaginal procedures for prolapse is rare. We present a case of acute delayed-onset postoperative hemorrhage with retroperitoneal hematoma formation following an otherwise uncomplicated anterior colporrhaphy.

2. Case Report

A 40-year-old woman presented to urogynecology with bothersome vaginal prolapse. Her history was notable for multiple sclerosis, prior dilation and curettage, and prior cesarean section. Evaluation revealed stage II anterior wall prolapse, moderate distal rectocele, and unremarkable urodynamics. She ultimately underwent an uncomplicated combined anterior and posterior colporrhaphy with cystoscopy under general endotracheal anesthesia with use of local anesthetic vaginally (1% lidocaine with epinephrine). Plication was completed with a single layer of vertical mattress sutures with 2–0 Vicryl. The vaginal epithelium was reapproximated with 3–0 Vicryl in a running fashion. Intraoperative cystoscopy was normal with brisk bilateral ureteral efflux identified, demonstrating integrity and normal function of the urinary tract and bladder. There was no significant intraoperative bleeding, with hemostasis noted throughout, and total estimated blood loss of 50 mL. Her postoperative recovery was uncomplicated, and she was discharged home on postoperative day (POD) 0 in stable condition, several hours after procedure completion.

Two hours after discharge, the patient's husband called indicating that they were returning to the hospital by ambulance due to acute onset of severe pain and significant vaginal bleeding. Upon arrival at the emergency room (ER), the patient had visible pallor with mild hypotension (systolic blood pressure in the 100 s). A peripheral intravenous cannula was placed, fluid bolus was initiated, samples for laboratory analysis were drawn, and a bedside obstetric/gynecologic evaluation was done. Lab results were notable for slight anemia, with hemoglobin 10.7 g/dL, hematocrit 33.2% (from 12.8 g/dL, 29.0% preoperatively), leukocytosis of $16.9 \times 10^3/\mu L$ with left shift, and a normal complete metabolic panel. The patient was given IV narcotics for pain control, with inadequate relief. Focused assessment with sonography in trauma (FAST) exam was performed by the ER provider and was positive for

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blood in Morrison's pouch, the left upper quadrant, and the suprapubic area, consistent with hematoma. Pelvic exam revealed a tense anterior vaginal wall with intact incisions, no active bleeding, and a palpable midline hematoma extending to the umbilicus, appreciated due to her thin body habitus. Given these findings, a blood transfusion was initiated and she underwent emergency computed tomography (CT) imaging of the abdomen/pelvis. CT revealed a large pelvic hematoma (9.8 × 9.6 cm) markedly displacing the uterus superiorly and laterally, extraperitoneal free fluid, and active contrast extravasation from what appeared to be a vessel branching from the right internal iliac artery (Fig. 1). Notably, there were no abnormalities of the kidneys, ureters, or bladder identified on CT.

The decision was made to proceed to interventional radiology (IR) for embolization. Pelvic angiography was completed by IR via left common femoral artery access, which allowed access to the right internal iliac artery and coil embolization of active arterial bleeding from a small branch of the right uterine artery (Figs. 2–4). During embolization, the patient became hypotensive and tachycardic, but responded to additional blood transfusion and successful embolization. At procedure conclusion, she was transferred to the surgical intensive care unit for further resuscitation and monitoring. There was felt to be no indication for drainage or surgical management of the hematoma at that time. Her pain improved significantly almost immediately after embolization. She continued to improve and was transferred out of intensive care. Repeat CT was performed due to concern about possible ongoing bleeding, which revealed stable hematoma with no evidence of continued enlargement or active bleeding. During her hospitalization, she received a total of 6 units of packed red blood cells and was discharged home on hospital day 3.

After discharge, the patient presented to the ER on POD 8 complaining of bruising of the lower extremities, groin, and mons,

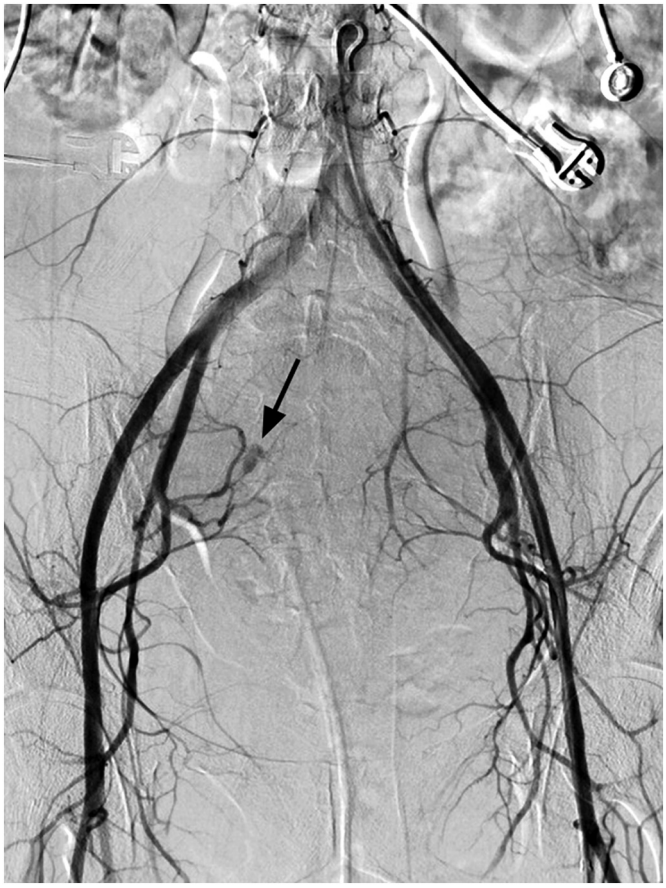

Fig. 2. Late digitally subtracted arteriogram (DSA). Late DSA arterial image shows a focus of active extravasation from a branch of the right internal iliac artery (arrow).

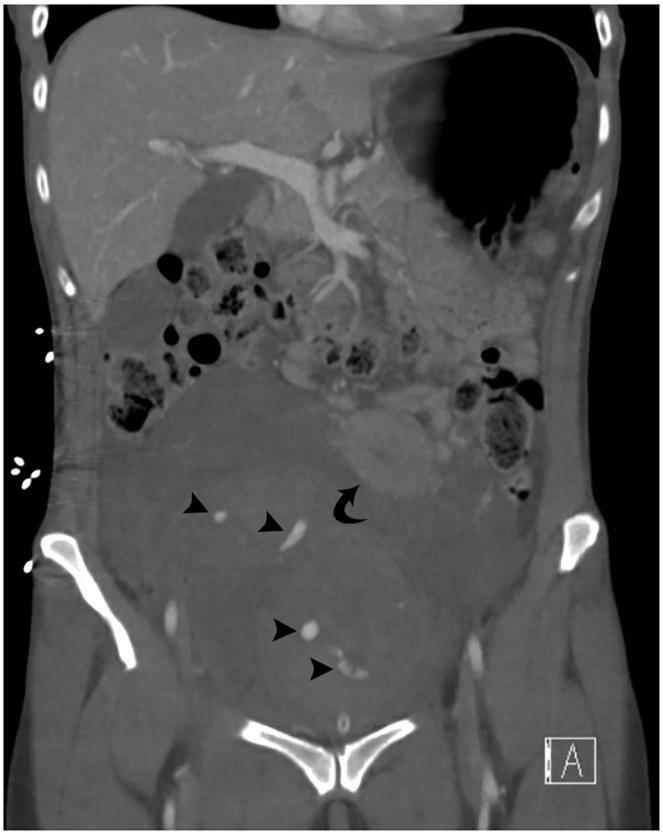

Fig. 1. Coronal CT abdomen/pelvis. Large pelvic hematoma with active extravasation (arrowheads) and displacement of the uterus (curved arrow) superiorly

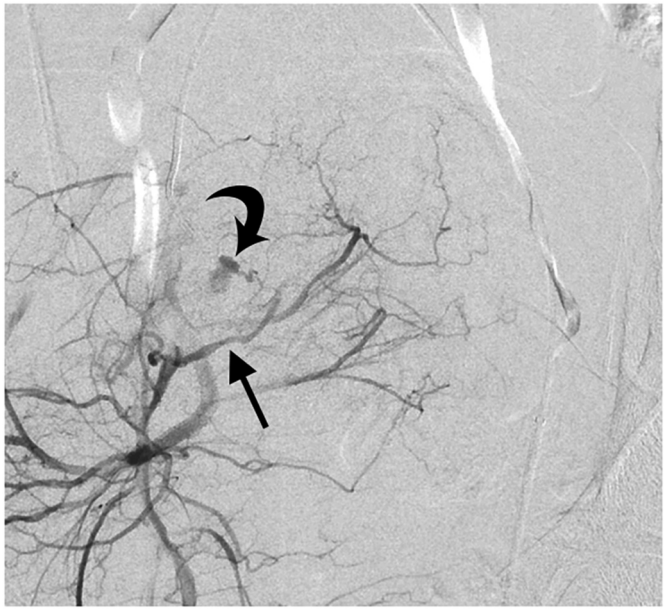

Fig. 3. Magnified DSA. Magnified DSA in the left anterior oblique projection demonstrating the active extravasation (curved arrow) from a small branch of the right uterine artery (arrow)

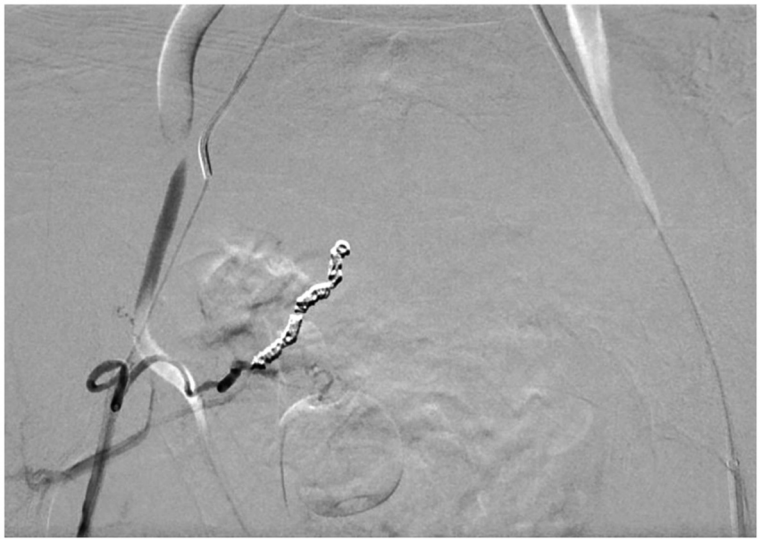

Fig. 4. DSA post coil embolization. DSA post coil embolization of the right uterine artery shows no further extravasation

lower extremity weakness, and subjective fever and chills. Her exam revealed evidence of blood from the pelvic hematoma tracking into the inguinal and leg compartments, with suspected local nerve irritation from reabsorbing blood. Labs were stable and there was no evidence of superimposed infection of the hematoma. She was subsequently discharged home, but then called on POD 10 reporting heavy vaginal bleeding, prompting repeat ER evaluation. Vital signs and labs were normal at that time. Pelvic exam showed dark, old blood repeatedly filling the speculum, suspected to be extrusion of the known hematoma. Repeat CT revealed an interval decrease in the size of the hematoma. She was admitted overnight for observation, remained stable, and was discharged home the following day. She was seen as an outpatient on POD 20 and POD 40, with exam notable for superficial wound separation of the anterior vaginal incision (1×3 cm) with intact underlying fibromuscular tissue and no evidence of infection. Her most recent visit was 3 months later, at which time she had noted an anterior vaginal fold. This corresponded to an area of redundant tissue at the level of the mid-urethra and bladder neck on exam, which was non-tender, without evidence of mass or prolapse, but was mobile and brought down easily with gentle traction. She ultimately opted to proceed with expectant management.

3. Discussion

As description of retroperitoneal hematoma following vaginal surgery is limited to case reports, this appears to be a rare complication, and one not previously described with vaginal native tissue anterior colporrhaphy. A critical component of the vascular supply to the uterus, cervix, and vagina is the uterine artery, which, after arising from the internal iliac artery, courses in a retroperitoneal fashion, ultimately traveling in the cardinal ligaments and joining the uterus at the level of the isthmus [10]. Doppler studies have indicated that the uterine arteries join the uterus within 17 mm of the lateral vaginal fornices [11]. The uterine artery then feeds the marginal artery that tracks laterally along the uterus, cervix, and cervicovaginal junction towards the lateral vagina [10]. The upper vaginal blood supply therefore involves an extension from the uterine artery as well as a vaginal branch from the internal iliac artery that anastomose at the lateral aspects of the vagina [10]. Given the close proximity of this vasculature to the vaginal apex and fornices, it is understandable that lacerations or surgical procedures in these areas could involve vessels with the potential for tracking in the retroperitoneal space, resulting in hematoma [4–7,12]. The retroperitoneal space encompasses a large area, bounded by the posterior parietal peritoneum anteriorly, the transversalis fascia posteriorly, and the diaphragm superiorly, extending inferiorly to the level of the pelvic brim [13]. As a result, retroperitoneal hemorrhage can cause rapid, large volume accumulation in this space.

The proximity of the ureters to pelvic vasculature and structures is also important, particularly in the setting of known vascular injury in the adjacent area. As part of their course within the pelvis, the ureters travel posterior to the uterine arteries lateral to the uterosacral ligaments, approximately 1.5 cm lateral to the internal cervical os [10]. The ureters then course medially through an areolar tissue plane within the cardinal ligaments, along the anterolateral cervix, obliquely towards the anterolateral vaginal fornices to enter the posterior aspect of the bladder [10]. Thus, in addition to possible vascular injury with vaginal procedures, there is the potential for ureteric injury or urinary tract complications, particularly with surgery involving the vaginal fornices. With vaginal surgery, intraoperative evaluation should assess the integrity and function of the lower urinary tract, and in the setting of vascular injury, diagnostic imaging should fully evaluate for concomitant urinary tract injury or compromise, as was done in our case.

Signs and symptoms of retroperitoneal hemorrhage can be nonspecific, as bleeding is often concealed, which may delay diagnosis and appropriate management if this diagnosis is not considered [14]. Presentation can include pain in the groin, abdomen, or flank, ecchymosis of the back or flank, tachycardia, and hypotension, although hemodynamic instability and coagulopathy typically represent late signs as the retroperitoneal space can contain a large blood volume before symptoms of hypovolemia occur [13,14]. Computed tomography (CT), particularly spiral CT or CT angiography, appears to provide the best combination of ready availability and ability to fully assess retroperitoneal hemorrhage [14,15]. While high-level evidence to guide management is lacking, initial management strategies should involve conservative measures, including fluid resuscitation, blood transfusion, and correction of coagulopathies [14]. Detecting a retroperitoneal hematoma in the early stages can be challenging [13], such that additional measures beyond resuscitation are often indicated [14]. Presence of hemodynamic instability and/or an expanding hematoma are important considerations for more aggressive management [14]. In this setting, involvement of IR with selective arterial embolization or endovascular stenting is felt to be the treatment of choice, with avoidance of an open surgical approach [14]. Open surgery may be indicated if the patient remains unstable, an IR approach is unsuccessful, and/or abdominal compartment syndrome develops [14,16,17]. Delays in diagnosis

could result in the inability to manage the case conservatively or in a minimally invasive fashion. Morbidity and mortality rates associated with retroperitoneal hematoma are high [18–20], with some indication that hematoma volume is predictive of mortality [20]. Much of the evidence around mortality, however, draws from vascular surgery, abdominal trauma, and cardiac catheterization literature, and these individuals may differ from those undergoing urogynecologic surgery.

Our patient presented with many signs and symptoms suggestive of retroperitoneal hematoma, and illustrates the importance of prompt imaging, initiation of resuscitative measures, and involvement of IR if this diagnosis is suspected. Aside from highlighting the rarity with which retroperitoneal hematoma occurs with vaginal native tissue prolapse repair, this case also describes an unusual delayed-onset acute presentation. Overall, it underscores the need to consider retroperitoneal hemorrhage if symptoms are potentially suggestive of this diagnosis, even in the setting of recent surgical procedures thought less likely to result in this complication.

Declaration of Competing Interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

Contributors

Each of the three authors made substantial contributions to the case report, assisted in drafting and critically revising the case report for content, and approved the final manuscript.

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Patient Consent

Obtained.

Provenance and Peer Review

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