

Retropubic Hematoma from the Corona Mortis Artery Injury after Sling Placement

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Abstract

Retropubic hematoma is not common but known surgical complication especially after retropubic sling placement. Most of time, the hematoma builds up from the venous bleeding, however arterial bleeding can occur. Corona mortis artery is located posterior to the superior pubic ramus, close to the quadrilateral plate of the acetabulum, where the retropubic trocar exits typically. It is a common variant arterial anastomosis between either the external iliac artery or deep inferior epigastric artery and the obturator artery. Injury to this anastomosis may cause significant hemorrhage. Although it is rare, an unrecognized pelvic/retropubic hematoma can be detrimental and lead to serious consequences including death. Early recognition and proper diagnosis is key to manage the corona mortis injury. This case report describes the three common approaches to manage retropubic hematoma: (1) Conservative management with careful observation, (2) Surgical intervention and/or (3) Selective arterial embolization.

Keywords: Retropubic hematoma, Midurethral Sling Placement, Perioperative Complication, Corona Mortis Artery

1. INTRODUCTION

Urinary incontinence is a common condition in women. According to the available data, 25% to 75% of women experience some degree of urinary leakage.¹⁻⁴ Treatment options for stress urinary incontinence (SUI) range from conservative management options (pelvic floor muscle exercises (with or without physical therapy), behavioral and lifestyle modifications, and continence-support pessaries) and surgical management options (anti-incontinence procedures, such as urethral bulking agents, retropubic colposuspension, autologous fascial slings, and synthetic midurethral slings (MUS)).⁵ Perioperative complications of retropubic MIS surgery include injuries to the lower urinary tract, hemorrhage, bowel injury, wound complications, retention, and urinary tract infection.⁵ Retropubic hematoma is not common but known surgical complication especially after retropubic sling placement. Most of time, the hematoma builds up from the venous bleeding, however arterial bleeding can occur.

Corona mortis artery is located posterior to the superior pubic ramus, close to the quadrilateral

plate of the acetabulum, where the retropubic trocar exits typically. It is a common variant arterial anastomosis between either the external iliac artery or deep inferior epigastric artery and the obturator artery.⁶ Injury to this anastomosis may cause significant hemorrhage. Although it is rare, an unrecognized pelvic/retropubic hematoma can be detrimental and lead to serious consequences including death. There are three common approaches to manage retropubic hematoma: (1). Conservative management with careful observation, (2) Surgical intervention and/or (3) Selective arterial embolization.

This case report describes a patient with massive retropubic hematoma after MUS sling placement and how the complication was managed.

2. CASE PRESENTATION AND MANAGEMENT

2.1. Presentation and Intraoperative Findings

A 68 years old parity 5 (all normal vaginal deliveries) with mixed urinary incontinence (SUI dominant) and symptomatic stage 3 pelvic organ prolapse (POP, rectocele only) presented at outpatient urogynecology clinic with a strong desire for surgical management. Patient denied



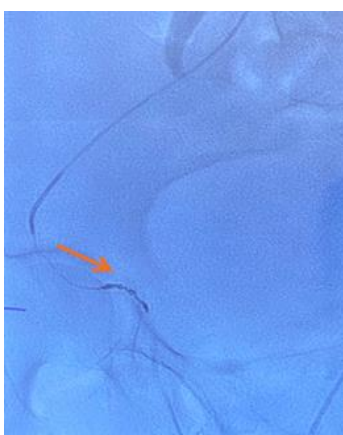
history of abnormal Pap smear, mammogram or postmenopausal bleeding. Past medical histories were notable for cirrhosis of liver (under control) and history of thrombocytopenia (baseline at 100-110, 000 per microliter (/mcL)). Past surgeries included cholecystectomy, appendectomy, and tubal ligation then reversal.

At presentation, her vital signs were within normal limits and physical exam was significant for positive cough stress test and stage 3 rectocele dominant POP with POP-Q: -2,-2,-7/4.5,3,8/+2, +2, -7. Postvoid residual volume was only 20 milliliters (mL), and urine was negative for infection. Preoperative evaluation showed normal urinary tract on renal/bladder ultrasound and normal sized uterus but with endometrial fluid on transvaginal ultrasound. Urodynamic testing with rectocele reduction was consistent with SUI (MUCP 70cmH2o, CLPP 35 cmH2O) without evidence of detrusor overactivity.

After extensive discussion with risks, benefits and alternatives, mutual decision was made to

proceed for exam under anesthesia, posterior colporrhaphy, perineorrhaphy, retropubic sling, hysteroscopic dilation and curettage (HSC D&C: for presence of endometrial fluid and reported postmenopausal spotting), and cystoscopy.

Medical clearances obtained from her Gastrointestinal specialist for her known history of cirrhosis and her Hematology for history of thrombocytopenia. Preoperative platelet count was 107,000/mcL. Intraoperatively, after uncomplicated HSC D&C and sling placement, unusual amount of bleeding noted from the uterine lining, the vagina was packed and the planned posterior colporrhaphy was on hold while waiting for the stat lab result for the platelet count and coagulation factors: Even if coagulation factors returned within normal limits, the platelet count was 60,000/mcL. No more vaginal bleeding was noted. Patient was extubated without issues and transferred to the post-anesthesia unit while awake and alert.

Figure 1	Figure 2	Figure 3
A large right pelvic sidewall retropubic hematoma (13cm x 11cm) with focus of brisk active extravasation originating from right corona mortis	Interventional Radiology Angiogram showing the source of brisk bleeding from the right corona mortis artery (see the arrow)	Interventional Radiology Angiogram showing the successful embolization of the right corona mortis artery with an endovascular coil (see the arrow)
		

2.2. Postoperative Evaluation and Management

Patient was kept on nothing by mouth and intravenous (IV) fluid for close observation with repeating physical exam and serial labs. Patient remained awake and alert with normal vital signs initially, then 3 hours after the procedure, she started complaining of right pelvic pressure and pain. Her vital signs at the time was blood pressure of 100-130’s/50-60’s and heart rate of 100’s. Urinary foley stopped draining urine even after the vaginal packing was removed. No vaginal bleeding was noted. Postoperative labs

returned with hematocrit of 28.5 L/L (preop 36 L/L). While getting blood products (patient received total 3 units packed red blood cells/3 fresh frozen plasmas/2 platelets), IV access was maximized with central line. CT abdomen/pelvis (A/P) with angiogram was performed urgently to rule out internal arterial bleeding. CT A/P angiogram showed a large right pelvic sidewall retropubic hematoma (13cm x 11cm) with focus of brisk active extravasation originating from right corona mortis (see *Figures 1&2*). Interventional Radiology (IR) was contacted

urgently and successful IR embolization was performed with an endovascular coil (see *Figure 3*). Patient remained stable with normal vital signs and excellent urine output. The serial labs were also stable at hemoglobin 10-11 g/dL/platelet 100-150,000/mcL and white blood cells at 6-7,000/mcL. And right pelvic pain was controlled with by mouth medication only. She was discharged home on postoperative day #2 with foley home care and close outpatient follow up.

2.3. Postoperative Follow Ups

At 2 weeks postoperative visit, patient was recovering well without any anemic or infectious symptoms. The pain was well controlled. Vital signs were normal limits. She also passed active void trial and able to urinate normally. The size of retropubic hematoma was stable.

At 6 weeks postoperative visit, patient was continuously doing well, reporting normal urinating and regular bowel movement. No longer requiring pain medications. Lab values were hemoglobin 12.7 g/dL/platelet 109K/mcL/white blood cells 4.9K/mcL. Vital signs were within normal limits (BP 110/70, HR 90, RR 18 O₂ 99% RA, Temp 36C). benign abdominal and pelvic exam with postvoid residual of 10mL. Right retropubic hematoma was 7cm in size and less tender. Urine dip was all negative for infection. No vaginal bleeding or worsening rectocele was noted.

At 6 months postoperative visit, right retropubic hematoma was completely resolved. Patient also denied SUI or POP symptoms.

3. DISCUSSION

MUS is considered a gold standard to treat SUI. Knowledge of retropubic pelvic vascular anatomy is important to avoid vascular injuries during surgery. If the corona mortis artery is injured and unrecognized in the timely manner, catastrophic hemorrhage can lead to death. According to cadaver study,⁷ among 38 hemisected pelvises, 8 pelvises (21%) had aberrant obturator arteries in 8 pelvises (21.05 %). Four of them (9.5 %), the obturator artery originated from the inferior epigastric artery. When Hu, et al (2021) investigated the location of the corona mortis vessels in 28 young patients, using preoperative magnetic resonance imaging, 75% (21/28) of patients had an identifiable, ipsilateral corona mortis; 90% of which were venous and 10% arterial. The vessel was typically 8.3 ± 3.8 mm medial and 11.1 ± 5.3 mm caudal from the antero supero

medial edge of the iliopectineal eminence.⁸ Another cadaver study by Du, et al (2020), among 16 unilateral pelvises in 7 cadavers, the corona mortis was observed on 12 unilateral pelvises (75%). 7 of them had vein anastomosis (43.75%), 3 of them with arterial anastomosis (18.75%), and 2 had both arterial anastomosis and vein anastomosis (12.5%). The corona mortis length ranged between 24.5 and 37.5 mm (average of 30.7 ± 3.6 mm); the diameter ranged between 1.6 and 3.5 mm (average of 2.5 ± 0.5 mm) and the distance between the vessels and the pubic tubercle was between 53.9 and 65.2 mm (average of 59.0 ± 3.6 mm).⁹ According to a systemic review on corona mortis analyzed total 40 references between 1996 to 2020¹⁰ the mean incidence of corona mortis was 63% (the majority venous) among 3,107 hemi pelvises. The incidence of bilateral corona mortis was lower than that of unilateral variations based on the analysis of 831 pelvises. The mean caliber of the anastomosis was 2.8 mm among 1,608 hemi pelvises. There is no consensus concerning the anthropometric influences in corona mortis and they concluded that corona mortis is not an unusual anatomical variation.

Although the typical MUS trocar exit site is 2 cm lateral from the midline, some of the corona mortis artery can be present at the trocar exit site because it is not an unusual anatomical variant, which could lead to the rapidly expanding retropubic hematoma that can be catastrophic.

Early recognition and proper diagnosis during the immediate postoperative period is key to manage the corona mortis injury. Retropubic hematoma can be managed with three common approaches: (1) Conservative management with careful observation, (2) Surgical intervention and/or (3) Selective arterial embolization the urogynecologic surgeons should not underestimate the risk of encountering the anastomosis when operation sites involve the retropubic area, specially the retropubic MUS procedures.

4. DECLARATION OF PATIENT CONSENT

The author certifies that she had obtained all appropriate patient consent forms. In the form the patient has given her verbal consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published, and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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