FPMR Challenges on behalf of the Collaborative Research in Pelvic Surgery Consortium (CoRPS): managing complicated cases

Series 1: Adverse events after a sacrocolpopexy: management and recommendations on treatment of a vesicovaginal fistula

Ladin A. Yurteri-Kaplan¹ · Danielle D. Antosh² · Maria A. Bortolini³ · Wolfgang Umek⁴ · Shunaha Kim-Fine⁵ · Cara L. Grimes⁶

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Case

Our patient is a 48-year-old para 2 who underwent a robotic-assisted supracervical hysterectomy, sacrocolpopexy, posterior colpoperineorrhaphy, and cystoscopy for stage 3 prolapse 3 years ago. The surgeon used monofilament polypropylene lightweight mesh and attached it to the cervix, vagina, and sacrum with braided non-absorbable polyethylene terephthalate sutures. On postoperative day 7, she underwent a primary repair with permanent sutures of an 8-mm port site hernia with associated small bowel obstruction and bowel incarceration.

One year later, she reported persistent vaginal drainage. CT imaging was concerning for a possible enterovaginal fistula. She underwent an exploratory laparoscopy, lysis of adhesions, and colonoscopy. On vaginal inspection, there was vaginal mesh and suture extrusion distal to the anterior cervix draining clear fluid. The exposed suture and mesh were removed, and

the vaginal mucosa was undermined circumferentially and closed.

Three years later she reported gross hematuria, vaginal bleeding, and pain. She has a well-supported cervix and vagina. Cystoscopy revealed inflammation and a friable bladder mucosa superior to the trigone. No clear mesh erosion was seen but areas of possible mesh were visible just below the urothelium.

How would you proceed?

Expert urogynecologist recommendations

Dr. D. Antosh (Urogynecology, Texas, USA)

Complications requiring surgery after sacrocolpopexy are rare, but this patient experienced reoperation for port site hernia and excision of vaginal mesh exposure. She now presents with a bladder mesh erosion. I would recommend imaging with a CT urogram to further evaluate the ureters and confirm no evidence of infection surrounding the mesh, which could lead to mesh exposure and erosion. I would prefer to approach this case abdominally with a robotic excision of mesh. A robotic approach will allow for better visualization of the surrounding tissue and anatomy to allow for adequate excision of the mesh in the bladder and a tension-free closure of the defect in multiple layers. If there are signs of infection, then the mesh should be cultured and the entire mesh excised.

Dr. M. Bortolini (Urogynecology, Sao Paulo, Brasil)

Initially, the vaginal mesh exposure was treated conservatively because of a lack of major complications. Faced with new complaints, the upper urinary tract and ureters warrant imaging. I

✉ Ladin A. Yurteri-Kaplan
ly2401@cumc.columbia.edu

¹ Department of Obstetrics and Gynecology, Columbia University Medical Center, 622 West 168th Street, New York, NY 10032, USA

² Department of Obstetrics and Gynecology, Houston Methodist Hospital, Houston, TX, USA

³ Department of Gynecology, Universidade Federal de Sao Paulo, Sao Paulo, Brazil

⁴ Department of Obstetrics and Gynecology, Medical University Vienna, Wien, Austria

⁵ Department of Obstetrics and Gynecology, University of Calgary, Calgary, Canada

⁶ Department of Obstetrics and Gynecology, New York Medical College, Valhalla, NY, USA

recommend a more invasive procedure laparoscopically or robotically with a wide resection of the whole anterior vaginal/cervical portion of the mesh. It seems the bladder muscular layer was eroded by the mesh. The mucosal inflammation suggests that the mesh is in close relation with the mucosa and will eventually erode into the bladder. I recommend a cystoplasty with resection of the posterior friable area of the bladder, followed by cystorrhaphy in two layers and bilateral double-J stents. An omental flap could be interposed between the bladder and the vagina to avoid fistulae. The posterior vaginal/cervical portion of the mesh would still support the vagina.

It is important to mention that the mesh is potentially colonized by bacteria. One must consider other mesh-related complications such as infection of the posterior vaginal mesh or infection at the sacrum. If complete mesh resection is required because of infection, an autologous fascia can be used to support the vagina.

Dr. W. Umek (Urogynecology, Vienna, Austria)

Assuming the current diagnosis is mesh erosion into the vagina and bladder, I would rule out upper urinary tract pathology with a CT uroterogram. However, this pathology is probably not the cause of her gross hematuria.

I would counsel the patient regarding the following options:

- (1) “Nihil facere”—Do not do more invasive procedures, instead expectantly manage the patient emphasizing this would not improve her current symptoms.
- (2) Perform an abdominal (open or endoscopic) surgery aiming to remove the cervix and the entire mesh abdominally. Then close the eroded vaginal and bladder sites in conjunction with urology. Colorectal surgery should be on stand-by. Preoperative preparation involves placing ureteral stents. Counseling should include information about the possibility of a partial bladder resection, intraoperative injury to the ureters and bowel, need for a temporary bowel diversion (stoma), not being able to remove all the mesh, and risk of future erosion and fistula.
- (3) Surgery aiming to do as little as possible although it would incur the same risks.
- (4) I believe that her chance of cure from mesh erosion is better with the removal of all mesh AND the cervix.

Dr. S. Kim-Fine (Urogynecology, Alberta, Canada)

Despite the visualization of possible mesh under the urothelium, one should be cautious about jumping to the conclusion that this is the cause of all of the patient's symptomatology. It would be prudent to err on the side of conservative management.

Since the EUA ruled out mesh exposure, I would consider atrophy as a possible cause of vaginal bleeding and start nightly vaginal estrogen. I would also request a flexible sigmoidoscopy to rule out rectal bleeding. The differential diagnosis includes cervical bleeding caused by cervicitis or cyclic bleeding from the cervical glands. I would perform a focused pelvic examination to evaluate pelvic floor tension myalgia.

If the patient remains symptomatic after a trial of conservative treatment, then I would have a frank discussion about the risks of attempting a surgical dissection in the vesicovaginal plane and excision of the mesh. As the apex is well supported, a transvaginal route is not likely to be successful. Therefore, a laparoscopic or robotic approach should be offered. She would be counseled about the increased risk of bleeding, enterotomy, cystotomy, and future vesicovaginal fistula formation especially in the setting of two previous pelvic surgeries. Importantly, she should also understand that such a procedure may not cure all her symptoms.

Preoperatively, bilateral ureteric stent placement should be planned, as the location of the potential mesh exposure is close to the trigone and ureteric orifices. If cystotomy occurs, primary repair using the principles of mobilization and multi-layered and tension-free closure should be undertaken. I advise interposing an omental flap in this area that has been traumatized and devascularized. Postoperatively, an indwelling transurethral or suprapubic catheter can be left for 10–14 days along with vaginal estrogen therapy for 6 weeks and twice a week thereafter.

How the case was managed

Since there was no obvious erosion but urothelium friability, we recommended close surveillance with cystoscopies every 6 months and vaginal estrogen. A year later, the patient presented with vaginal bleeding, foul discharge after intercourse, urine debris, and bladder pressure. She had granulation tissue along the posterior vaginal wall and adequate vaginal support. She had stopped the vaginal estrogen and was restarted. Examination under anesthesia and cystoscopy performed for surgical planning diagnosed a vesicovaginal fistula at the prior friable urothelium site with a suture visible. Additionally, she had a posterior vaginal wall mesh exposure below the granulation tissue, which was easily removed, and the muscularis and epithelium were approximated. A flexible sigmoidoscopy ruled out rectovaginal fistula. Afterwards, a CT urogram was negative for ureterovaginal fistula and inflammation. Finally, she underwent a robotic-assisted laparoscopic vesicovaginal fistula repair with omental flap, cystoscopy with bilateral ureteral stents, and suprapubic tube placement. A Fogarty catheter (a common cardiac catheter) was placed through the fistula to better identify it during the fistula repair (Figs. 1 and 2). The

entire mesh was not resected. At her 4-week postoperative visit, she denied leakage, discharge, or discomfort.

Literature review

Complications after the use of synthetic grafts are challenging. Patients can present with a variety of symptoms, and persistent vaginal bleeding or discharge and recurrent urinary tract infections after mesh placement should prompt further evaluation [1]. In this case, evaluation originally revealed friable urothelium without clear evidence of erosion. The initial recommendation was conservative. In a multivariate analysis, medical treatment efficacy with local estrogen or antiseptic for the treatment of vaginal mesh exposure is approximately 24% (level 4 evidence) [2]. Similar to our initial approach, one of the four experts considered a conservative approach. The persistent nature of these symptoms prompted further evaluation, which ultimately revealed a fistula.

All our international experts were in agreement that preoperative imaging of the upper urinary tract was essential to rule out ureteral involvement prior to any treatment. The incidence of ureteral injury during gynecologic surgery varies between 0.02 and 1.7% and is increased with prolapse surgery [3].

When vaginal mesh exposure reoccurs or mesh infection is present, most case reports and case series discuss an abdominal approach to mesh removal [2]. Similarly, all four experts recommend an abdominal approach for treatment of mesh erosion and fistula with a sacrocolpopexy. Two experts recommend use of an omental flap between the vagina and bladder to prevent future fistula. Two experts were concerned about mesh infection and bacterial colonization compromising the mesh and surrounding tissue. The rate of bacterial colonization is

Fig. 1 Fogarty catheter has been placed into the fistula tract from the vagina and pulled laterally in this abdominal view. The eroded mesh is visible along with the permanent suture that created the fistula tract between the bladder and vagina

Fig. 2 The full extent of the defect in the bladder can be seen with exposed urothelium. Resection of the mesh and permanent suture next to this defect along with resection of unhealthy tissue both at the bladder and vagina were performed

unknown; however, the clinical significant infection rate is less than 1% after sacrocolpopexy (level 4 evidence) [2].

The experts differed in recommendations for the degree of mesh resection. Two experts recommended a local resection removing only mesh involved in the fistula and surrounding tissue, while the other two experts recommended complete resection of the mesh. In limited studies, the rate of vaginal mesh or suture erosion after abdominal sacrocolpopexies is cited as 4.2–10% [4, 5], but there is limited literature regarding recommendations between partial vs. complete resection of the mesh. Most of the existing information is based on transvaginal mesh and is from either case series or retrospective cohorts [6]. In a retrospective mixed cohort of women who had transvaginal mesh, sacrocolpopexies, and midurethral slings from The Netherlands evaluating partial vs. complete mesh resection, those who underwent complete resection had a higher rate of complications and prolapse recurrence with no difference in relief of symptoms between partial and complete excision [7]. Most complications occurred in patients who underwent abdominal excision of mesh used in sacrocolpopexies. These authors recommended partial excision for mild symptoms while complete excisions are reserved for complex cases given the higher risk of complications [7]. Currently, most recommendations are based on expert opinion given the lack of evidence-based information.

Among our experts there is consensus on the preoperative evaluation and abdominal approach to this case. Interestingly, opinions vary regarding partial and complete mesh excision. This variation is likely due to the lack of evidence-based literature to guide surgeons on management. In such a circumstance, we rely on expert opinion until further evidence is established.

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Compliance with ethical standards

Conflicts of interest Danielle Antosh is site principal investigator for the Cook Myosite randomized trial funded by Cook: [ClinicalTrials.gov](https://clinicaltrials.gov)

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