



# Take this simplified approach to correcting exposure of vaginal mesh

➡ By proceeding stepwise, uncomplicated exposures lend themselves to the generalist’s care. Here are management pearls, cautions, and gauges of success.

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**CASE** Pain during intercourse, well after mesh implantation

Your patient, 61 years old, para 3, has come to your office by referral with a complaint of dyspareunia. The history includes placement of a synthetic vaginal mesh kit 14 months earlier for prolapse.

The medical record shows that the referring physician performed a “mesh excision” 1 year after the original procedure.

The woman reports that she is “very frustrated” that she is still dealing with this problem so long after the original procedure.

On examination, you note a 2.5-cm diameter area of exposed mesh in the anterior vagina, with healthy surrounding tissue and without inflammation or purulence (FIGURE 1). You are unable to reproduce her complaint of pain on vaginal examination.

What options can you offer to this woman?

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**FIGURE 1** Examination of your referred patient: Mesh is noticeably exposed



And will those options meet her therapeutic expectations?

The recent increase in the use of mesh grafts to reconstruct pelvic anatomy has been directed mainly at improving surgical outcomes. Yet, at the same time, gynecologic surgeons find themselves facing a rise in associated complications of such surgery that they did not see previously.

Among the most troublesome and concerning of those complications are 1) **exposure of mesh** through the vaginal epithelium and 2) **contraction or hardening of mesh** (or both) that can result in dyspareunia and chronic pelvic pain. Other, rare complications include infection and fistula.

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**ON THE WEB**

Watch simplified management of mesh exposure along the anterior vaginal wall, at [obgmanagement.com](http://obgmanagement.com)



Our goal in this article is to address the management of graft-healing abnormalities in which a segment of the mesh is palpable or visible, or both, within the vaginal canal. Our focus is on simple abnormalities that can be managed by most generalist gynecologists; to be clear, more complex abnormalities, and those that provoke more serious or lasting symptoms, belong under the care of a specialist.

### A recent shift in terminology is significant

Early on, this complication was called “erosion”; as understanding of the mechanism of its development grew, however, terminology applied to the problem has changed.

In fact, mesh itself very rarely erodes into the vagina or an underlying viscus. Instead, the complication occurs most commonly as a result of **disruption of a suture line**—most likely the result of a hematoma or localized inflammation that develops postoperatively.

“Exposure” (our preference here) and “extrusion” are now the recommended terms, based on a consensus terminology document published this year jointly by the International Urogynecological Association and the International Continence Society.<sup>1</sup>

Exposure of implanted mesh is considered a “simple” healing abnormality because it typically

- occurs along the suture line and early in the course of healing
- is not associated with infection of the graft.<sup>2</sup>

The typical physical appearance is one of visible mesh along an open suture line without granulation tissue or purulence—again, see **FIGURE 1**. The mesh is firmly adherent to the vaginal epithelial edges and underlying fascia.

The reported incidence of mesh exposures—in regard to currently used meshes, which are all **Type-1, monofilament, macroporous polypropylene grafts**—is approximately 10% but as high as 15% to 20% in some reported series.<sup>3,4</sup> The higher rates of exposure are usually seen in series in which some patients have had a synthetic graft implanted as an overlay to fascial midline plication. When the graft is implanted in the subfascial layer of the vaginal wall (i.e., with-

out midline plication), however, the reported rate of exposure falls—to 5% to 10%.<sup>5-7</sup>

## Recommendations for management

### Most common problem: Exposure

Initially, recommendations for “erosion” management were based on concerns about underlying mesh infection or rejection, and included a need to remove the entire graft. That recommendation still applies to **multi-filament, microporous grafts** that present with inflammatory infiltrates, granulation tissue, and purulence. Although these kinds of grafts (known as “**Type-2/3 grafts**”—e.g., GoreTex, IVS) have not been marketed for pelvic reconstruction over the past 3 to 5 years, their behavior post-implantation is less predictable—and patients who have delayed healing abnormalities are, therefore, still being seen. It’s fortunate that development of an overlying biofilm prevents tissue incorporation into these types of graft, allowing them to be removed easily.

Exposures related to Type-1 mesh—currently used in pelvic reconstruction—that occur without surrounding infection do *not* require extensive removal. Rather, they can be managed conservatively or, when necessary, with outpatient surgery. In patients who are not sexually active, exposures are usually asymptomatic; they might only be observed by the physician on vaginal examination and are amenable to simple monitoring. In sexually active patients, exposure of Type-1 mesh usually results in dyspareunia or a complaint that the partner “can feel the mesh.” Depending on the size and the nature of symptoms and the extent of the defect, these commonly seen exposures can be managed by following a simple algorithm.

**Palpable or visible mesh fibrils** can be trimmed in the office; they might even respond to local estrogen alone. Consider these options if the patient displays vaginal atrophy.

Typically, vaginal estrogen is prescribed as 1 g nightly for 2 weeks and then 1 g two or three nights a week. Re-examine the



**When the graft is implanted in the subfascial layer of the vaginal wall, the reported rate of exposure is 5% to 10%. When it is implanted as an overlay to fascial midline plication, however, the exposure rate can be as high as 15% to 20%.**

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**FIGURE 2** Incision of vaginal epithelium



Allow for a 0.5-cm margin.

**FIGURE 3** Undermining and mobilization of epithelium



Perform wide dissection.

**WATCH THE VIDEO**

**Simplified management of mesh exposure along the anterior vaginal wall**



**4 ways to watch this video:**

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patient in 3 months; if symptoms of mesh exposure persist, it's unlikely that continued conservative therapy will be successful, and outpatient surgery is recommended.

When exposure is **asymptomatic**, you can simply monitor the condition for 3 to 6 months; if complaints or findings arise, consider intervention.

**Small (<0.5 cm in diameter) exposures** can also be managed in the office, including excision of exposed mesh and local estrogen. If the exposure is easily reachable, we recommend grasping the exposed area with pickups or a hemostat and with gentle traction, using Metzenbaum scissors to trim exposed mesh as close to the vaginal epithelium as possible. Local topical or injected anesthesia may be needed. Bleeding should be minimal because no dissection is necessary. Silver nitrate can be applied for any minor bleeding. **Larger (0.5–4.0 cm) exposures** are unlikely to heal on their own. They require outpatient excision in the operating room.

Preoperative tissue preparation with local estrogen is key to successful repair of these exposures. Vaginal estrogen increases blood flow to the epithelium; as tissue becomes well-estrogenized, risk of recurrence diminishes.

The technique we employ includes:

- circumferential infiltration of vaginal epithelium surrounding the exposed mesh with 1% lidocaine with epinephrine
- sharp circumscription of the area of

exposure, using a scalpel, with a 0.5-cm margin of vaginal epithelium (**FIGURE 2**)

- wide dissection, with undermining and mobilization of surrounding healthy vaginal epithelium around the exposure (**FIGURE 3**)
- excision of the exposed mesh and attached vaginal mucosa, with careful dissection of the mesh off underlying tissues with Metzenbaum scissors—being careful to avoid injury to underlying bladder or rectum (**FIGURE 4**, page 36)
- reapproximation of mesh edges, using 2-0 polypropylene suture to close the resulting defect so that prolapse does not recur (**FIGURE 5**, page 36)
- closing of the previously mobilized vaginal epithelium with 2-0 Vicryl suture, without tension, to cover the reapproximated mesh edges—after irrigation and assurance of adequate hemostasis (**FIGURE 6**, page 38).

The choice of closure—vertical or horizontal—depends on the nature of the original defect.

You can watch a video of this technique that we've provided. Follow the instructions in the margin of this page.

Several cautions should be taken with this technique, including:

- avoiding narrowing the vaginal canal
- minimizing trauma to healthy vaginal epithelium that will be used for closure
- maintaining hemostasis to avoid formation of hematomas.

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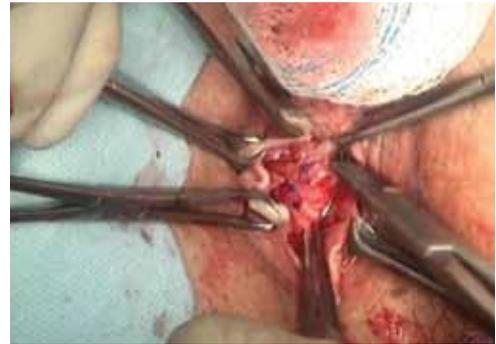


**FIGURE 4** Dissection of mesh from underlying tissue



Keep clear of underlying bladder and rectum!

**FIGURE 5** Reapproximation of edges to re-establish support



Our choice of suture is 2-0 polypropylene.

**Largest (>4 cm) exposures** are likely the result of devascularized sloughing of vaginal epithelium. They are, fortunately, uncommon.

It's unlikely that, after excision of exposed mesh, the vaginal epithelial edges can be approximated without significantly narrowing or shortening the vaginal canal. Proposed techniques for managing these large exposures include covering the defect with a biologic graft, such as small intestinal submucosa, to allow epithelium to re-grow. Regrettably, prolapse is likely to recur in the unprotected area that results.

#### Contraction and localized pain

Hardening and contraction typically occur along the fixation arms of the mesh. These complications might result from mesh shrinkage or from mesh being placed too tight, so to speak, at implantation. Rarely does the entire implanted mesh contract.

Severe mesh contraction can result in localized pain and de novo dyspareunia. Symptoms usually resolve after identification of the painful area and removal of the involved mesh segment.<sup>8</sup>

**Diagnostic maneuver.** In-office trigger-point injection of bupivacaine with triamcinolone is useful to accurately identify the location of pain that is causing dyspareunia. After injection, the patient is asked to return home and resume sexual intercourse; if dyspareunia diminishes significantly, surgical removal of the involved mesh segment is

likely to ameliorate symptoms.

If dyspareunia persists after injection, however, the problem either **1)** originates in a different location along the graft or **2)** may not be related to the mesh—that is, it may be introital pain or preexisting vaginal pain.

The findings of trigger-point injection and a subsequent trial of sexual intercourse are useful for counseling the patient and developing realistic expectations that surgery will be successful.

**Management note:** Mesh contraction should be managed by a surgeon who is experienced in extensive deep pelvic dissection, which is necessary to remove the mesh arms.

#### Chronic pain

Diffuse vaginal pain after mesh implantation is unusual; typically, the patient's report of pain has been preceded by recognition of another, underlying pelvic pain syndrome. Management of such pain is controversial, and **many patients will not be satisfied until the entire graft is removed.** Whether such drastic intervention actually resolves the pain is unclear; again, work with the patient to create realistic expectations *before* surgery—including the risk that prolapse will recur and that reoperation will be necessary.

**Management note:** An existing pelvic pain syndrome should be considered a relative contraindication to implantation of mesh.

### FAST TRACK

**Mesh contraction should be managed by a surgeon who is experienced in extensive deep pelvic dissection, which is necessary to remove the mesh arms**

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**FIGURE 6** Irrigation of vaginal epithelium, followed by closure



Before you close, ensure that hemostasis is adequate.

### Infection of the graft

Rarely, infection has been reported after implantation of Type-1 mesh—the result of either multi-microbial colonization or isolated infection by *Bacteriodes melaninogenicus*, *Actinomyces* spp, or *Staphylococcus aureus*. Untreated preoperative bacterial vaginitis is likely the underlying cause, and should be considered a contraindication to mesh implantation.

Typically, these patients complain of vaginal discharge and bleeding early postoperatively. Vaginal exposure of the mesh results from local inflammation and necrosis of tissue.

**Management note:** In these cases, it is necessary to **1)** prescribe antimicrobial therapy that covers gram-negative and anaerobic bacteria **and 2)** undertake surgical removal of the exposed mesh, as we outlined above.<sup>9</sup>

### Visceral erosion or fistula

Many experts believe that what is recorded as “erosion” of synthetic mesh into bladder or rectum is, in fact, a result of **unrecognized visceral perforation at original implantation**. This is a rare complication of mesh implantation.

Patients who experience mesh erosion into the bladder may have lower urinary-tract symptoms (LUTS) of urgency, frequency, dysuria, and hematuria. Any patient who reports de novo LUTS in the early postoperative period after a vaginal mesh procedure should receive office cystourethroscopy to ensure that no foreign body is present in the bladder or urethra.

**Management note:** Operative cystourethroscopy, with removal of exposed mesh, is the management of choice when mesh is found in the bladder or urethra.

Patients who have constant urinary or fecal incontinence immediately after surgery should be evaluated for vesicovaginal or rectovaginal fistula.

The presence of any of these complications necessitates removal of the involved mesh *in its entirety*, with concomitant repair of fistula. Typically, the procedures are performed by a specialist.

### Our experience with correcting simple mesh exposures

During the past year at our tertiary referral center, 26 patients have undergone mesh revision because of exposure, using the technique we described above (**FIGURES 2–6**). The problem resolved in all; none had persistent dyspareunia. Many of these patients had already undergone attempts at correction of the exposure elsewhere—mostly, in the office, using techniques appropriate for that setting. Prolapse has not recurred in the 10 patients who required reapproximation of mesh edges because of a defect >2.5 cm.

## Pearls for avoiding mesh exposures

- Preoperatively, prepare the vaginal epithelium with local estrogen cream (recommended dosage: 1 g, two nights every week for a trial of at least 6 weeks)
- Use hydrodissection to facilitate placement of the graft deep to the vaginal epithelial fibromuscular fascial layer
- Do not place a synthetic mesh as an overlay to a midline fascial plication
- Be fastidious about hemostasis
- Close the vaginal epithelium without tension
- Leave vaginal packing in place for 24 hours
- Consider using biologic grafts when appropriate (as an overlay to midline plication when used on the anterior vaginal wall).

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**CASE RESOLVED** Treatment, improvement

Under your care, the patient undergoes simplified outpatient excision of the exposed area of mesh. Mesh edges are reapproximated to support the resulting 3-cm defect.

At a 12-week postop visit, you note complete resolution of the exposure and normal vaginal caliber. The patient continues to apply estrogen cream and reports sustained improvement in sexual function.

**For simple presentations, success is within reach**

Simple mesh exposure can (as in the case we described) be managed by most gynecologists, utilizing the simple stepwise approach that we outlined above (for additional tips based on our experience, see “Pearls for avoiding mesh exposures,” page 38). In the case of more significant symptoms, de novo dyspareunia, visceral erosion, or fistula, however, referral to a specialist is warranted. ☞

**References**

1. Haylen BT, Freeman RM, Swift SE, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint terminology and classification of the complications related directly to the insertion of prosthesis (meshes, implants, tapes) and grafts in female pelvic floor surgery. *Int Urogynecol J Pelvic Floor Dysfunct.* 2011;22(1):3–15.
2. Davila GW, Drutz H, Deprest J. Clinical implications of the biology of grafts: conclusions of the 2005 IUGA Grafts Roundtable. *Int Urogynecol J Pelvic Floor Dysfunct.* 2006;17(suppl 1):S51–55.
3. Iglesia CB, Sokol AI, Sokol ER, et al. Vaginal mesh for prolapse: a randomized controlled trial. *Obstet Gynecol.* 2010;116(2 pt 1):293–303.
4. Hiltunen R, Nieminen K, Takala T, et al. Low-weight polypropylene mesh for anterior vaginal wall prolapse: a randomized controlled trial. *Obstet Gynecol.* 2007;110(2 pt 2):455–462.
5. Fattouh B, Amblard J, Debodiance P, Cosson M, Jacquetin B. Transvaginal repair of genital prolapse: preliminary results of a new tension-free vaginal mesh (Prolift technique)—a case series multicentric study. *Int Urogynecol J Pelvic Floor Dysfunct.* 2007;18(7):743–752.
6. Diwadkar GB, Barber MD, Feiner B, Maher C, Jelovsek JE. Complication and reoperation rates after apical vaginal prolapse surgical repair. *Obstet Gynecol.* 2009;113(2):367–373.
7. Nguyen JN, Burchette RJ. Outcome after anterior vaginal prolapse repair: a randomized controlled trial. *Obstet Gynecol.* 2008;111(4):891–898.
8. Feiner B, Maher C. Vaginal mesh contraction: definition, clinical presentation, and management. *Obstet Gynecol.* 2010;115(2 pt 2):325–330.
9. Athanasiou S, Matthaiou DK, Falagas ME. Vaginal mesh infection due to *Bacteroides melaninogenicus*: a case report of another emerging foreign body related infection. *Scand J Infect Dis.* 2006;38(11–12):1108–1110.

**NEWS FROM THE MEDICAL LITERATURE****Transvaginal mesh surgery reduces pelvic organ prolapse****But dyspareunia may develop in premenopausal women**

Transvaginal mesh (TVM) surgery is effective in treating pelvic organ prolapse (POP) in both pre- and postmenopausal women but dyspareunia may worsen in premenopausal women, according to a study published online May 23 in the *Journal of Sexual Medicine*.

Cheng-Yu Long, MD, PhD, from Kaohsiung Medical University in Taiwan, and colleagues compared the changes in sexual function of premenopausal and postmenopausal women after TVM surgery. A total of 68 sexually active women, categorized as premenopausal (36) and postmenopausal (32), with symptomatic POP stages II to IV were referred for TVM surgery. Preoperative and postoperative assessments included pelvic examination using the POP quantification (POP-Q) system, and completing the Female Sexual Function Index (FSFI), Urogenital Distress Inventory (UDI-6), and Incontinence Impact Questionnaire (IIQ-7).

The investigators found significant improvement in the POP-Q analysis at points Aa, Ba, C, Ap, and Bp in both groups but not in total vaginal length. The UDI-6 and IIQ-7 scores decreased significantly after TVM surgery. The dyspareunia domain score decreased significantly after surgery only in the premenopausal group. Reports of diminished scores of the dyspareunia domain and total scores were more common among women in the premenopausal group, but there were no significant differences in FSFI domains or total scores between the groups.

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**Mesh exposures that involve significant symptoms, de novo dyspareunia, visceral erosion, or fistula warrant referral to a specialist**