Published in final edited form as:

Female Pelvic Med Reconstr Surg. 2012 ; 18(5): 303–305. doi:10.1097/SPV.0b013e318264c8e0.

Delayed Presentation of Pseudoabscess Secondary to Injection of Pyrolitic Carbon-Coated Beads Bulking Agent

Mitchell B. Berger, MD, PhD and Daniel M. Morgan, MD

Pelvic Floor Research Group, Division of Gynecology, Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor, MI, USA

Abstract

Background—Periurethral masses after injection of Durasphere® bulking material have been previously reported to occur within 12-18 months of administration of the agent.

Methods—We present a case report of an anterior vaginal wall mass resulting from a pseudoabscess containing Durasphere® agent 5 years after injection. A literature review of urethral bulking agent complications and imaging is also provided.

Results—The patient's anterior vaginal wall mass was thought to be due to a pseudoabscess secondary to injection of bulking agent. Pelvic imaging was helpful both in identifying the mass and in surgical planning. The patient was successfully treated by outpatient transvaginal resection of the material.

Conclusions—Urethral bulking agents, while generally safe and effective in the treatment of stress urinary incontinence, can lead to formation of pseudoabscesses. Although these are usually recognized within the first 18 months after injection, they may not be identified until several years later.

Keywords

Durasphere; Urethral Bulking Agent; Pelvic Imaging; Vaginal Wall Mass; Pseudoabscess

Introduction

Urethral bulking agents have been successfully used for more than ten years to treat stress urinary incontinence (SUI). In general, these agents have been proven to be safe and well-tolerated. A rare complication that has been described for various agents is subsequent mass or pseudoabscess formation. We present a case of an unusually late presentation of an anterior vaginal wall mass resulting from a periurethral pseudoabscess containing Durasphere® (Carbon Medical Technologies, Inc., St. Paul, MN) material.

Corresponding Author: Mitchell B. Berger, MD, PhD, Address: Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, University of Michigan Health System, L4000 Women's Hospital, 1500 E. Medical Center Drive, SPC 5276, Ann Arbor, MI 48109-5276, Telephone: (734) 764-8429, Fax: (734) 647-9727, mitchberg@umich.edu.

Financial Disclaimer/Conflict of Interest: None

Authors' Contributions: MB Berger: Manuscript writing/editing
DM Morgan: Manuscript writing/editing

Case Report

A 37 year-old gravida 4, para 2 presented with complaints of progressive dyspareunia. Her past medical history was significant for stage II cervical cancer, obesity, type II diabetes, nephrolithiasis, and stress urinary incontinence. Her treatment for cervical cancer occurred 13 years prior, and included simple total abdominal hysterectomy, bilateral salpingo-oophorectomy and intracavitary radiation therapy. There had been no evidence of recurrent disease since that time.

Due to her history, evaluation was undertaken by the Gynecologic Oncology and Urology services. She had a normal Pap smear without neoplastic or dysplastic cells and a normal cystourethroscopy. However, a computed tomographic (CT) scan of the abdomen and pelvis revealed a 2.6×1.5 cm high-attenuation mass adjacent to the right base of the bladder, anterior to the vagina (Figure 1a). She was therefore referred to the Urogynecology service. The presence of a tender anterior vaginal wall mass was confirmed. The operative notes of her stress incontinence treatments were requested, documenting that the patient had a midurethral sling composed of a hybrid type I polypropylene mesh and biologic graft (BioArc™, American Medical Systems, Minnetonka, MN) placed 6 years prior to presentation. One year later, she underwent cystoscopically-directed periurethral injection of six 1 mL syringes of Durasphere® due to persistent incontinence.

After consultation with Radiology, a pelvic MRI was obtained to better characterize the mass. A heterogeneous mass was again noted at the bladder base and surrounding the urethra (Figure 1b). Based on the appearance and location of the mass, it was felt most likely to be related to her previous bulking agent injection. The patient desired surgical removal of the mass due to her significant dyspareunia.

Intraoperative findings included a normal bimanual examination with the exception of a palpable mass in the right periurethral space. The mass was more difficult to palpate under anesthesia than it had been in the clinic setting. Intraoperative viewing of the patient's pelvic imaging was therefore helpful in determining the surgical site. Cystourethroscopy was performed revealing no evidence of a mass in the urethra or bladder. The anterior vaginal wall was then dissected until a cavity was reached containing several milliliters of a viscous but bland fluid encompassing the black particulate bulking material (Figure 2). There was no evidence of tissue edema or erythema. After expression of all the material, the cavity was irrigated with normal saline and closed with interrupted polyglactin 910 sutures. The vaginal epithelium was also reapproximated with polyglactin 910 suture. At the completion of the procedure, repeat cystourethroscopy confirmed bilateral ureteral efflux and a normal appearing bladder and urethra without evidence of trauma.

At 3 months postoperative follow-up, the patient was subjectively largely symptom free without evidence of SUI or mass recurrence. Multichannel urodynamics revealed no demonstrable urinary incontinence or detrusor overactivity and a maximum urethral closure pressure of 110 cm H₂O. Her pelvic pain and dyspareunia had improved, but was not completely resolved. Further discussions with the patient revealed significant long-standing emotional and psychological trauma, so she was referred for sexual help counseling.

Discussion

Durasphere® is a commonly used injectable urethral bulking agent for the treatment of stress urinary incontinence. The material is composed of pyrolytic carbon-coated beads suspended in a water-based gel. The composition of Durasphere® was designed to provide a durable, non-migratory agent of low immunogenic potential.¹ Recent experience, however, suggests that complications of this urethral bulking agent can lead to such complications as pseudoabscess formation, urethral prolapse, or migration.²⁻⁶

Patients with a urethral bulking agent-induced pseudoabscess typically present with pain and/or dyspareunia, lower urinary tract symptoms and a mass in the vagina.^{2, 3, 6, 7} If a pseudoabscess is suspected, pelvic imaging may be helpful in confirming the diagnosis. The composition of the pyrolytic carbon-coated beads in Durasphere® leads to relatively characteristic findings on both CT and MRI, including CT density similar to bone, and hypointensity on T1- and T2-weighted MRI images. Imaging can therefore be used to highlight numerous properties including the volume of material injected or tissue extravasation.⁸ In addition, a pseudoabscess often appears larger on imaging than would be suspected based on the original volume of agent injected, due to the inflammatory processes involved.^{2, 3}

Pelvic imaging was extremely helpful in identifying the size, location and nature of the periurethral mass identified in this patient. Furthermore, the mass was more difficult to palpate under anesthesia than it had been in the clinic. We suspect this was due to anesthetic-induced muscle relaxation and the steeper lithotomy position afforded by being in the operating room. As such, viewing of the images in the operating room enhanced efficient and safe evacuation of the migrated bulking agent. We therefore recommend usage of imaging to supplement a workup for suspected pseudoabscess.

Previous retrospective analysis suggests that symptoms of a periurethral mass after urethral bulking agent injection typically manifest within 18 months.^{2, 3, 5, 6} It is not clear when the patient in this report began to develop symptoms of the Durasphere® pseudoabscess. Nonetheless, the mass was identified 5 years after the initial injection of the bulking agent. This report therefore extends the time frame for which this complication may be expected to be identified.

Management options for urethral bulking agent-induced pseudoabscesses include expectant management, needle drainage or surgical evacuation.³ Although the patient described in this report remained continent after surgical evacuation of the pseudoabscess, patients should be counseled that recurrent stress urinary incontinence is common after such procedures.³ Treatment options for recurrent stress incontinence, such as concomitant or future midurethral or bladder neck sling placement, should therefore be discussed.

Risk factors for complications of urethral bulking agents have not been fully characterized, but may include biomechanical properties of the material used, host tissue activity, and the volume of agent injected.⁹ We speculate that multiple factors contributed to pseudoabscess formation in our patient: a large volume of agent was injected, she received previous pelvic

radiation therapy, the patient is diabetic, and she is morbidly obese with a body mass index greater than 42 kg/m².

Several factors contributed to the complexity of this case. The patient was a relatively poor historian, her medical history was complicated by the previous cervical cancer diagnosis, and physical examinations were limited due to her obese body habitus. Collaborative discussions between the urologists, gynecologic oncologists, radiologists and urogynecologists involved in her care were helpful in determining the etiology of her pelvic mass. Access to her records from outside institutions was also critical in piecing together the sequence of events leading to the presentation described in this report.

The “ideal” urethral bulking agent, with excellent tissue bulking, host immunocompatibility, and minimal migration, has yet to be identified. Nonetheless, when used judiciously and appropriately, these materials can play an important role in the treatment of stress urinary incontinence. Patients and providers must be made aware of potential complications, including pseudoabscess or migration.

References

1. Lightner D, Calvosa C, Andersen R, Klimberg I, Brito CG, Snyder J, et al. A new injectable bulking agent for treatment of stress urinary incontinence: results of a multicenter, randomized, controlled, double-blind study of Durasphere. *Urol.* 2001 Jul; 58(1):12–5. [PubMed: 11445471]
2. Sweat SD, Lightner DJ. Complications of sterile abscess formation and pulmonary embolism following periurethral bulking agents. *J Urol.* 1999 Jan; 161(1):93–6. [PubMed: 10037377]
3. Lightner DJ, Fox J, Klingele C. Cystoscopic Injections of Dextranomer Hyaluronic Acid Into Proximal Urethra for Urethral Incompetence: Efficacy and Adverse Outcomes. *Urol.* 2010; 75(6): 1310–4. [PubMed: 20299087]
4. Ghoniem GM, Khater U. Urethral prolapse after duraspHERE injection. *Int Urogynecol J Pelvic Floor Dysfunct.* 2006 May; 17(3):297–8. [PubMed: 15986098]
5. Pannek J, Brands FH, Senge T. Particle migration after transurethral injection of carbon coated beads for stress urinary incontinence. *J Urol.* 2001 Oct; 166(4):1350–3. [PubMed: 11547072]
6. Madjar S, Sharma AK, Waltzer WC, Frischer Z, Secrest CL. Periurethral mass formations following bulking agent injection for the treatment of urinary incontinence. *J Urol.* 2006 Apr; 175(4):1408–10. [PubMed: 16516009]
7. McLennan MT, Bent AE. Suburethral abscess: a complication of periurethral collagen injection therapy. *Obstet Gynecol.* 1998 Oct; 92(4 Pt 2):650–2. [PubMed: 9764649]
8. Bridges MD, Petrou SP, Lightner DJ. Urethral bulking agents: imaging review. *Am J Roentgenol.* 2005 Jul; 185(1):257–64. [PubMed: 15972433]
9. Poon CI, Zimmern PE, Wilson TS, Defreitas GA, Foreman MR. Three-dimensional ultrasonography to assess long-term durability of periurethral collagen in women with stress urinary incontinence due to intrinsic sphincter deficiency. *Urol.* 2005 Jan; 65(1):60–4. [PubMed: 15667864]

Figure 1.

A heterogeneous mass was identified at the bladder base on both CT scanning (Figure 1a) and MRI (Figure 1b [spoiled gradient echo-weighted image]). The pseudoabscess is indicated by the arrow in each image. B, Bladder; R, Rectum.

Figure 2.
Surgical dissection of the anterior vaginal wall exposed a cavity filled with a mixture of viscous fluid containing black particulate matter.