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Management of a Severely Calcified Fibroid Requiring Intraoperative Orthopedic Surgery Consultation: A Case Report

Sarah Ashmore MD[1]*, Anthony Christiano MD[2] and Kimberly Kenton MD[1]

[1]*Section of Urogynecology and Reconstructive Pelvic Surgery, University of Chicago, Chicago, IL.*

[2]*Section of Orthopedic Surgery and Rehabilitation Medicine, University of Chicago, Chicago, IL.*

***Correspondence:**
Sarah Ashmore, MD, Section of Urogynecology and Reconstructive Pelvic Surgery University of Chicago, Chicago, IL.

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ABSTRACT

Background: *Surgeons often use morcellation techniques in cases with large fibroid uteri to maintain a minimally invasive approach. It is extremely rare that standard techniques fail to morcellate a fibroid.*

Case: *A 77 year-old postmenopausal women presented with an enlarged fibroid uterus and pelvic organ prolapse and elected to proceed with a total vaginal hysterectomy, bilateral salpingo-oophorectomy, colpocleisis, perineorrhaphy, retropubic synthetic midurethral sling, and cystoscopy. Intraoperative, a large 16 cm calcified fibroid was encountered and standard surgical techniques to manually morcellate the fibroid were unsuccessful. Orthopedic surgery was consulted intraoperatively. Utilizing orthopedic bone fragmenting instruments, the fibroid was able to be safely morcellated vaginally. There were no perioperative complications and the patient is doing well postoperatively.*

Conclusion: *Utilizing a multi-disciplinary approach and maximizing on the expertise of different surgical subspecialties avoided the need for laparotomy and maintained the benefits of a minimally invasive surgical approach.*

Keywords

Calcified uterine fibroid, Leiomyoma, Vaginal hysterectomy, Morcellation.

Introduction

The benefits of minimally invasive hysterectomy compared to open surgery are well understood and documented in literature [1,2]. Gynecologists have mastered minimally invasive techniques to remove large specimens from the abdominal cavity in women who previously would have required a laparotomy. In women with a large fibroid uterus, the uterus needs to be cut into smaller pieces (i.e. morcellated) for tissue extraction. Currently there are a variety of tissue extraction techniques being employed including power and manual morcellation [3,4]. Power morcellation utilizes electrical energy which is transformed into mechanical power to cut the specimen into smaller pieces with tissue removal through a laparoscopic port. Manual morcellation can be performed through a mini-laparotomy or vaginally through the colpotomy using a scalpel. Mini-laparotomy and transvaginal manual morcellation are associated with similar patient outcomes and recovery [5]. Vaginal hysterectomy is the preferred approach for benign indications with a faster return to normal activity, decreased rate of wound infections, and shorter hospital stay [1,2]. Morcellation of large fibroid uteri vaginally maintains the benefits of minimally invasive surgery. However, laparotomy is required if manual morcellation is unable to be safely performed. We present a case of a severely calcified fibroid uterus that was unable to be manually morcellated with standard surgical techniques. To avoid laparotomy, orthopedic surgery was consulted intraoperatively to discuss the use of orthopedic instruments to safely morcellate the calcified fibroid vaginally. The patient provided informed consent for publication of this case.

Case

A 77-year-old postmenopausal woman was initially seen via telemedicine at our Urogynecology and Reconstructive Pelvic Surgery clinic for pelvic organ prolapse and urgency urinary incontinence. The patient complained of a bothersome vaginal bulge for many years. She previously had tried a vaginal pessary which continuously fell out despite multiple pessary fittings. She also noted bothersome vaginal discharge, lower abdominal pressure and heaviness, urgency urinary incontinence, urinary frequency, constipation and need to splint to have a bowel movement. The patient had two prior spontaneous vaginal deliveries and denied a history of operative vaginal delivery or cesarean section. Medical history was significant for atrial fibrillation, breast cancer, hyperlipidemia, and hypertension. She previously had a pacemaker placed and was on chronic anticoagulation for atrial fibrillation. Unilateral complete mastectomy was performed at the time of breast cancer diagnosis and she completed adjuvant chemotherapy greater than 20 years prior to presentation. The patient had a known history of uterine fibroids. Transvaginal ultrasound performed 2 years prior to presentation displayed a 7.2 x 6.1 x 14.2 cm uterus with a large submucosal calcified uterine fibroid measuring 9.4 x 6.8 x 7.7 cm. Endometrial thickness was 1.8 cm and fluid-filled. Endometrial biopsy at that time was negative. At our initial new patient telemedicine visit, repeat transvaginal ultrasound was ordered given her history. The follow up plan was for in office examination with multichannel complex urodynamic testing to evaluate her lower urinary tract symptoms. The transvaginal ultrasound was performed prior to in office examination which displayed a 9.2 x 6.7 x 8.6 cm uterus with 5.5 x 3.4 x 4.7 cm posterior, intramural calcified fibroid. Endometrial thickness was 3.9 mm and bilateral ovaries appeared normal. In person office examination displayed stage III anterior predominant uterovaginal prolapse. Cervical elongation was not appreciated at this visit. The uterus was noted to be enlarged and retroflexed with a firm fibroid posteriorly. An endometrial biopsy was performed due to patient report of persistent vaginal discharge. Pathology was benign. Multichannel complex urodynamic testing displayed urodynamic stress incontinence. The patient desired surgical management of uterovaginal prolapse and was no longer interested in penetrative sexual intercourse. She was consented for a total vaginal hysterectomy, bilateral salpingo-oophorectomy, retropubic synthetic midurethral sling, and cystoscopy. Appropriate clearance and discontinuation of anticoagulation was obtained ahead of surgery.

Intraoperatively, an examination under anesthesia was performed and displayed an enlarged, severely calcified fibroid uterus. On bimanual examination, the uterus was approximately 17 cm with the calcified fibroid accounting for most of the uterine cavity. Cervical elongation to 6 cm was noted. A foley catheter was inserted into the bladder for the remainder of the case and a standard approach to a vaginal hysterectomy was performed. After the anterior and posterior peritoneum were entered, the cardinal ligament was serially clamped, suture ligated and transected with incorporation of the uterine vessels bilaterally. A large 16 cm calcified fibroid was encountered which prevented further advancement on the broad ligament. Attempt was made to morcellate the fibroid using standard surgical techniques (i.e. scalpel and scissors). Standard surgical techniques were unable to penetrate the calcified fibroid and the fibroid was unable to be manipulated to allow for adequate visualization to continue the vaginal hysterectomy safely. The surgical team discussed next steps including conversion to laparotomy given the inability to morcellate the fibroid with standard techniques; however, given the size and calcification a large abdominal incision would be required. Orthopedic surgery was consulted intraoperatively to utilize their skill set to perform vaginal morcellation of the calcified fibroid. While the urogynecology team provided vaginal retraction and protection of the bladder, rectum, and vaginal side walls, a Stryker Core Ultra High Torque Drill fitted with a 6.0 mm round fluted bur and ronguer were utilized to morcellate the calcified fibroid. Once the fibroid was removed, the urogynecology team was able to complete the remainder of the procedure. There were no intraoperative complications and the estimated blood loss was 150 milliliters. Surgical pathology was benign and consistent with a degenerative, calcified fibroid uterus. Uterine weight of 742.4 grams.

The patient was admitted for 23-hour observation after surgery. On postoperative day 1, she was meeting all milestones, voiding spontaneously, and discharged home. At the 3-month postoperative visit, she was doing well after surgery without any complaints or bothersome symptoms. Examination displayed a well-healed narrowed 4 cm long vagina. She had no postoperative complications.

Discussion

It is extremely rare that a fibroid is unable to be morcellated with standard surgical techniques. To the best of our knowledge, we report the first case of a severely calcified fibroid encountered during a vaginal hysterectomy that was managed with orthopedic surgical techniques. Utilizing a creative multidisciplinary approach avoided the need for laparotomy and maintained the benefits of a minimally invasive approach.

Encountering fibroids in postmenopausal women is rare because their growth is estrogen dependent [6]. However, enlarging fibroids in postmenopausal women has been previously reported [7-10]. Other estrogens and growth factors have been suggested to influence fibroid growth in postmenopausal women including hormone replacement therapy and obesity. Degeneration of fibroids can occur if they outgrow or lose their vascular supply. Types of degeneration include hyaline, myxomatous, calcific, cystic, or red degeneration [11]. Hyaline degeneration is the most common form overall and calcific degeneration is most common in postmenopausal women [12,13]. As a woman ages, the vascular supply to the fibroid diminishes resulting in ischemic tissue necrosis and calcium phosphates and carbonates are deposited in the fibroid. Calcium is deposited on the periphery of the fibroid, which can continue to become more calcified as degenerative

changes occur. To the best of our knowledge, prior case reports of an enlarged calcified fibroid in a postmenopausal woman were either successfully morcellated to maintain a minimally invasive approach or a laparotomy was the route of choice from the beginning of the case [14-17]. We reported the first case of a severely calcified fibroid that was unable to be morcellated with standard surgical techniques and a unique multidisciplinary approach was utilized.

Orthopedic surgery is a surgical subspecialty dedicated to treating and repairing conditions that affect the musculoskeletal system including bones. Orthopedic surgeons are therefore familiar and specialized to utilizing surgical instruments designed to cut bone. On intraoperative examination, the consistency of the severely calcified fibroid was similar to the density of bone. Therefore, our team recognized the utility of consulting a surgical specialist who is comfortable and familiar with instruments that would have the ability to morcellate a fibroid with such density and calcifications. The two disciplines (Urogynecology and Reconstructive Pelvis Surgery and Orthopedic Surgery) were able to work together to employ both of their unique expertise and successfully morcellate the fibroid with bone fragmenting instruments while ensuring the critical structures in the pelvis were protected. The surgery was able to be completed vaginally avoiding the need for a laparotomy.

We report a unique way of approaching a difficult surgical scenario which was both safe and effective. We were able to maximize on the benefits of maintaining a vaginal approach which is the preferred route of hysterectomy for benign indications since it is associated with better postoperative outcomes [1,2]. Urogynecology and Reconstructive Pelvic Surgery and Orthopedic Surgery were able to work together to safely morcellate a severely calcified fibroid vaginally avoiding the need to convert to a laparotomy. It is essential to understand the unique skillsets of different surgical subspecialties and maximize on their expertise in a multidisciplinary approach during difficult, rare cases.

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