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Applying Today's Technologies to Vaginal Hysterectomy

While surgeons have traditionally removed the uterus through the vagina, this approach fell out of favor over the past few decades as it became easier to access the uterus through either large abdominal incisions or keyhole incisions made for laparoscopic or surgical robotic tools. But despite these advances, vaginal hysterectomy is now returning as surgeons

increasingly borrow technologies and techniques from laparoscopy and robotics to improve the exposure and visualization of the vagina and seal the blood vessels during vaginal surgery.

In July 2014, **Rosanne M. Kho, MD**, a gynecologist with expertise in minimally invasive surgery with a particular focus on benign gynecology and urogynecology, joined the Department of Obstetrics and Gynecology at New York-Presbyterian/Columbia University Medical Center, charged with both performing and teaching vaginal surgery.

"Most people think nothing has changed in vaginal surgery in the last 50 or years so," says Dr. Kho. "In fact, a lot has changed because of our background in minimally invasive surgery with the application of new technologies and surgical innovation. What we have seen is a transition of applying these technologies to an approach that has been in existence for a long time."

(continued on page 2)

"We have good studies that show that not only does the vaginal approach provide patients with the best advantages of low morbidity and fewer complications, there is also no visible incision since the surgeon enters through the body's true natural orifice."

— Dr. Rosanne M. Kho

Radiofrequency Thermal Ablation: A New Treatment for Uterine Fibroids

Uterine myomas, or fibroids, are the most common noncancerous tumors in women of childbearing age, occurring in 70 percent of white women and in more than 80 percent of African American women by the age of 50. While many women with uterine fibroids experience no noticeable symptoms, those with symptoms commonly include heavy menstrual bleeding, pelvic pain or pressure, pain during intercourse, lower back pain, and urinary symptoms.

"Every woman who walks into my office is offered an individualized treatment based on her symptoms, how many fibroids she has, where they are located, and her desire for future fertility," says **Yelena Havryliuk, MD**, a gynecologist and obstetrician in the Department of Obstetrics and Gynecology at New York-Presbyterian/Weill Cornell Medical Center, who specializes in the surgical management of fibroids and adnexal masses. "We can offer her different treatments. Medical therapies can help with the bleeding symptoms due to fibroids, but many times they cannot address other symptoms effectively. For patients

(continued on page 3)



Dr. Yelena Havryliuk



Applying Today's Technologies to Vaginal Hysterectomy *(continued from page 1)*

At the same time, Dr. Kho notes that vaginal hysterectomy is both difficult to teach and difficult to learn, citing one of the reasons its use has declined. “With laparoscopy or robotics, you use a camera to project a magnified view of the procedure on a screen and everyone can watch. Until recently, you couldn’t do that with the vaginal approach – the operating field was visible only to the surgeon through a tiny opening,” she says. In addition, throughout vaginal surgery, two assistants were occupied holding the retracting tools that open the labia and expose the vagina, making it difficult for them to observe and learn the procedure, she adds.

“If we look at national trends on how hysterectomies are performed, a greater majority of them are still being done abdominally; however, there is a rise in the number being done laparoscopically



Dr. Rosanne M. Kho

and robotically now,” explains Dr. Kho. “If you consider the major advantages of the vaginal approach, we know that we have good studies to show that not only does it provide patients with the best advantages of low morbidity and fewer complications, there is also no visible incision since the surgeon enters through the body’s true natural orifice. In addition, the patient experiences a faster recovery and return to normal activities. However, the approach is not being utilized.”

To change this paradigm, Dr. Kho and her colleagues have modified their techniques and instruments and, she says, “use what we have learned from robotics and laparoscopy to improve upon visualization. It’s also important to use the advanced scopes and overhead monitor camera so that the surgery can be projected and everybody in the room knows what is going on.”

One technology Dr. Kho has adopted is a table mounted camera system (called the Vitom® by Karl Storz) that utilizes a 90 degree camera and projects the procedure to an external monitor. “With the Vitom, whatever I’m seeing is transmitted simultaneously to a screen, which is not only helpful as a teaching tool, but also makes the procedure much safer because all of the participants – the anesthesiologist, scrub nurses, circulators, and assistants – are able to visualize what’s happening and can participate in the case.”

In addition, Dr. Kho uses a self-retaining retractor system, a frame that attaches to the operating room table that provides consistent and reliable exposure to the vagina without requiring

two surgical assistants at the bedside. “The assistants are not fatigued and can focus on how to learn the procedure,” she says.

Another recently adopted technology that has improved the feasibility of vaginal hysterectomy is a vessel-sealing tool – the advanced bipolar handheld energy device, which surgeons have begun using to seal hard-to-reach blood vessels. “When we’re operating on a large uterus, it’s hard to clamp, cut, and tie the blood vessels with your fingers and short instruments. So we are using the new technology to facilitate the procedure,” says Dr. Kho.

In addition to the difficulties of teaching and learning vaginal hysterectomy, gynecologists have accepted a set of guidelines that restricts patient eligibility for the procedure. “Vaginal hysterectomy has been traditionally thought of as appropriate only for women with small prolapsed uteruses. Women who have a large uterus, have had a previous cesarean delivery, have never been pregnant, or had a previous vaginal delivery were deemed ineligible for the procedure,” says Dr. Kho. “But in my experience, the only true contraindications should be malignancy or a high index of suspicion for a malignancy, pain that has not been previously evaluated, or known endometriosis. These patients would benefit from an approach that gives the surgeon a magnified view of the abdominal cavity and that does not require morcellation.”

Dr. Kho is focusing her research efforts on the use of power morcellation, which makes the uterus or fibroids easy to remove through the small incisions made during laparoscopy. “The FDA has issued warning statements about power morcellation and there has been a lot of attention from the media about it. We don’t use power morcellation during vaginal surgery, but the same concerns apply to manual morcellation – the surgeon could inadvertently cut up tissue containing malignant cells and spread them through the abdomen,” says Dr. Kho, who is investigating ways to contain the specimen before morcellation and is developing an algorithm to determine a patient’s risk factors for cancer before surgery. “If a woman’s risk scores high, she would not be a candidate for a minimally invasive approach and would be seen by an oncologist instead.”

Dr. Kho, who is Section Head of Female Pelvic Medicine and Reconstructive Surgery as well as Co-Director of the Fellowship in Minimally Invasive Gynecologic Surgery at Columbia, is eager to pass on the skills and techniques she has developed and honed to residents. “There is a lot of room for simulation in terms of improving education and training, and not just for the young trainees, but also for physician-surgeons who are in practice,” says Dr. Kho, who conducted the first cadaveric workshop in vaginal hysterectomy for the annual American Association of Gynecologic Laparoscopists Global Congress in 2012 and for the American Congress of Obstetricians and Gynecologists Annual Clinical Meeting in 2014. “My main mission is to help the residents finish their training feeling comfortable and confident – just like I did when I finished my residency – in doing simple vaginal procedures. It is a dying skill that should be preserved and can be updated.”

[Adapted from *Vaginal Hysterectomy: An Old Approach Gets New Life* by Beth Hanson, *Connections* Fall 2014, Columbia Women’s and Children’s Health]

For More Information

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Radiofrequency Thermal Ablation: A New Treatment for Uterine Fibroids *(continued from page 1)*

who are seeking to preserve their fertility we usually recommend myomectomy, using hysteroscopic, open, or minimally invasive approaches. For individuals who are not interested in childbearing there are a few other options now available.”

For patients who have failed medical therapy or who desired an alternative to major surgery, uterine fibroid embolization (UFE) was the only available option. However, UFE is not suitable for all patients. For example, UFE of large submucosal fibroids is contraindicated due to a high risk for infection. Nevertheless, in collaboration with the interventional radiologists, Dr. Havryliuk is capable of performing complex hysteroscopic resections of submucosal fibroids following UFE, allowing patients to complete their treatment minimally invasively.

A New Uterine Sparing Approach

Today, however, a novel uterine sparing approach – ultrasound-guided radiofrequency volumetric thermal ablation – has added another option for patients with fibroids. Recently approved by the Food and Drug Administration, the procedure incorporates the Acessa™ System, which enables the gynecologic surgeon to target and treat deep intramural fibroids that might not be easily visible via conventional laparoscopy. Through radiofrequency ablation, a small needle array applies thermal energy into each fibroid. The surrounding normal uterine tissue is not damaged or otherwise affected. The procedure results in a significantly shorter hospital stay and less intraoperative blood loss than laparoscopic or open surgery.

us to possibly visualize more fibroids than what were noted on preoperative imaging. Next we introduce the ablation needle into the fibroid and deploy the needle array. When we are satisfied with placement within the target fibroid, we perform the ablation.”

According to Dr. Havryliuk, a major advantage of the procedure is that due to the laparoscopic ultrasound guidance, the treatment is targeted to the fibroid tissue and minimizes injury to the surrounding tissues. In comparison to UFE, the Acessa procedure does not affect the blood supply to the ovaries.

“A major advantage of ultrasound-guided radiofrequency volumetric thermal ablation is that it only treats fibroid tissue and does not spread to surrounding tissue, such as the normal muscle of the uterus. The ablation also does not affect the blood supply to the ovaries.”

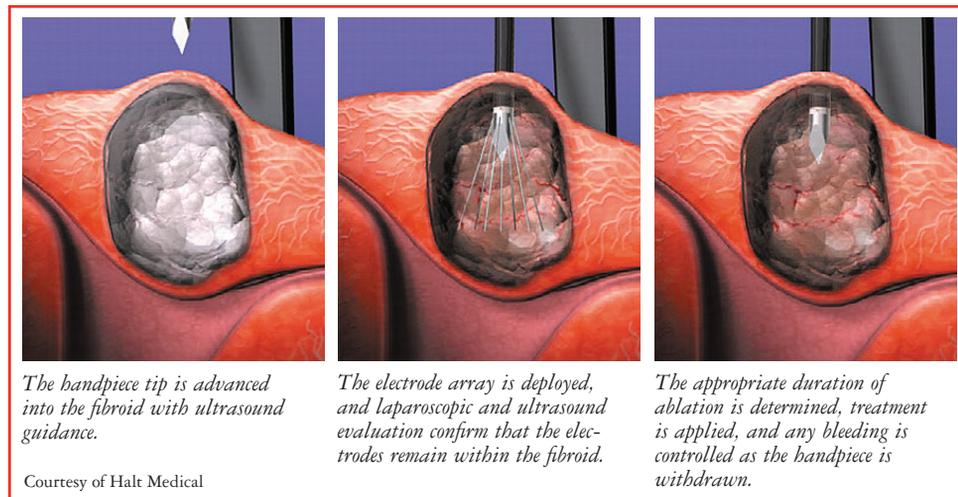
— Dr. Yelena Havryliuk

With regards to the mechanism of action, a contained electrical current travels between the needles. The duration and complexity of treatment is based on the size of the fibroid and length of the needles that are deployed. “For example, if I have a fibroid that requires deployment of a 2 to 3cm needle array, the total treatment time will take about three to four minutes, and this duration may increase depending on the size of the fibroid,” says Dr. Havryliuk, who also notes that the surgeon can simultaneously address other conditions that may be present, such as endometriosis or ovarian cysts.

Over three to six months the treated fibroid tissue shrinks, becomes less vascular, and may become completely resorbed by the body. Symptomatic relief of pelvic pain and pressure is usually seen shortly after the procedure is performed, and heavy bleeding is noticeably improved, sometimes as soon as the first menstrual period.

“Uterine fibroid embolization is usually recommended for patients who

are past fertility because sometimes this procedure can cause decreased ovarian reserve and possibly even early menopause. There is not enough data to determine if the Acessa procedure should be used for patients who want to conceive; therefore, at present it is only approved for patients who have completed childbearing. Nonetheless, the Acessa procedure does not compromise the blood supply to the ovaries, and it preserves healthy uterine tissue. The Acessa procedure to treat uterine fibroids represents a new tool in our repertoire that we can offer to our patients.”



To ablate targeted fibroids, the Acessa System delivers monopolar radiofrequency energy to tissue through a disposable electro-surgical radiofrequency handpiece that is connected to a generator. The generator provides sinusoidally varying voltage at 460 kHz to drive current through the tissue to be ablated, causing controlled, local heating that results in targeted tissue destruction.

“This is a same-day procedure performed under general anesthesia. Two small abdominal incisions are needed – there is no cutting, suturing, or removal of the uterus itself,” says Dr. Havryliuk. “Typically we perform a 5mm umbilical incision for the laparoscopic camera port and a 10mm suprapubic incision to insert the laparoscopic ultrasound in order to map the uterine fibroids. Due to the sensitivity of laparoscopic ultrasound, it also allows

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