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The five patients who previously reported menorrhagia reported eumenorrhea; no patients became amenorrheic. We have seen two patients in our larger series become menopausal, but both were older than 50 years at the time of surgery. None of the patients we have followed with FSH levels has lost ovarian function.

The average decrease in uterine volume at 3 months was 39.4%.

One of our patients has become pregnant and is currently doing well at 20 weeks' gestation.

Complications have been few. Among our original study patients, one passed round tissue vaginally 3 months postoperatively, but her white blood count was normal and she showed no signs of infection.

Simple endometrial adenomatous hyperplasia was diagnosed on the day of another patient's procedure; repeat office curettage showed benign endometrium 3 months later.

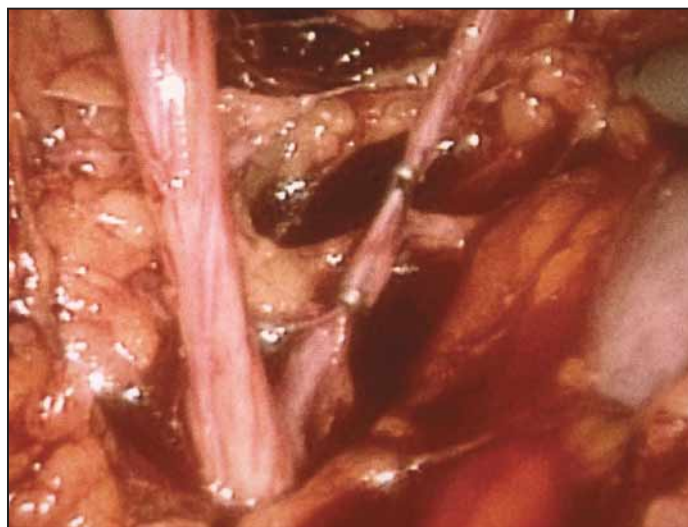
We bill for this procedure using code #37617 (ligation of major artery of the abdomen), after having obtained precertification with insurance companies. We have had no trouble being reimbursed for the procedure.

This procedure carries a very low risk of anesthesia complications, and abdominal entry injuries are possible.

Any procedure involving UAO has potential complications related to uterine ischemia.

Prolapse, vaginal expulsion of necrotic tissue, and pelvic infection are possible. Selecting patients who have adequate perfusion around myomas may decrease the risk of postocclusion infection.

Patient selection is also important with regard to myoma size. Laparoscopic visu-



In this view of the left retroperitoneum, two 5-mm endoscopic clips occlude the proximal portion of the left uterine artery.



This uterus is blanched as a result of hypoperfusion and ischemia after laparoscopic bilateral uterine artery occlusion.

PHOTOS COURTESY DR. MOISES LICHTINGER

alization becomes difficult in patients beyond a 20-week gestation uterine size, and we therefore refer these patients for embolization if they will not consider myomectomy or hysterectomy.

A Comparison of the Two Procedures

As opposed to radiologic embolization, which is a blind procedure, laparoscopic UAO offers an opportunity to diagnose endometrial cancer and sarcomas via fine-needle aspiration and myometrial biopsy.

Additionally, it can be offered as a global treatment for gynecologic complaints other than leiomyomas.

The majority of patients who are candidates for these procedures also have adhesions and/or endometriosis that may be a contributor to their pelvic pain.

In conclusion, we have found that the risks of laparoscopic UAO are minimal, and the benefits to carefully selected patients are considerable.

By contrast, radiologic UAE is a simple

procedure that has been proven efficacious for reducing symptoms. It is not, however, without risks.

Misembolization has been reported to the collateral uterine-ovarian vessel and the legs. Unintended embolization can lead to ovarian failure in 1%-4% of cases.

Pain is a considerable feature of the procedure, both from hypoxia and cramping, as the uterus attempts to expel the polyvinyl pellets. Many patients remain in the hospital for 23 hours on a morphine pump.

Up to 15% of patients experience postembolization syndrome, characterized by fever, anorexia, and nausea/vomiting.

Most importantly, radiologic UAE can be performed in patients with undiagnosed cancer that can evade diagnosis for many months.

There are several reports of embolization in a patient with undiagnosed uterine sarcoma.

Endometrial biopsy and MRI can assist in the presurgical diagnosis of sarcoma;

however, the laparoscopic approach is clearly more thorough in ruling out cancer.

The only real obstacle to widespread use of laparoscopic UAO is the dearth of advanced laparoscopic surgery training among U.S. gynecologic surgeons. This is a retroperitoneal vascular procedure, requiring skillful knowledge of the vascular anatomy.

Future Vaginal Approach?

Because there appears to be a need for a gynecologic alternative to the increasingly popular radiologic UAE, I have recently been working with colleagues and a private company—Vascular Control Systems of San Juan Capistrano, Calif.—to develop a technique to temporarily occlude the uterine arteries with a Doppler-guided, uterine artery clamp using a vaginal approach.

This procedure is still experimental, and we have thus far achieved fibroid shrinkage of approximately 30%. A clinical trial is under way to advance and improve this technique. ■

Apligraf Shows Promise in Building Vaginal Wall in Rokitansky Syndrome

NEW ORLEANS — Apligraf has been used successfully to line a new vagina in a patient with Mayer-Rokitansky-Küster-Hauser syndrome.

The human skin equivalent derived from human infant foreskin has been used widely for wound repair, but this is the first reported successful use for this purpose, Albert Altchek, M.D., reported at the annual meeting of the North American Society for Pediatric and Adolescent Gynecology.

The 19-year-old patient with congenital absence of the uterus and vagina refused the split-thickness skin graft typically used for treating the condition and instead underwent the Apligraf procedure. Perineal biopsy and dissection were used to create a vaginal space, and 20 Apligraf patches—sewn together and wrapped around a soft, inflatable vaginal stent—were applied to the space, said Dr. Altchek of Mount Sinai School of Medicine, New York.

After the patient remained on bed rest for 1 week, the stent was removed and a second Apligraf application was placed. A week later, the Apligraf lining was found to be degenerating as a result of graft rejection; however, a small patch of vaginal mucosal cells that had been present proliferated to

cover the entire neovagina. Soft vaginal stents were used to prevent strictures.

The result was a soft, pliable, moist, normal-looking vaginal mucosal wall, which has maintained patency for 6½ years without a stent, Dr. Altchek said.

Apligraf was previously thought to stimulate only skin growth, but based on this case, it appears that it "actually preferentially stimulates another tissue—mucosa," he said.

In the case of the 19-year-old patient, she had an excellent result. At 6-month follow-up she had normal cytology, and at 4 years she reported frequent sexual activity with orgasm. At last contact she was being referred for a surrogate gestational carrier.

This new method for correcting the defects associated with Mayer-Rokitansky-Küster-Hauser syndrome is investigational but shows great promise, he said, noting that it has several advantages over the split-thickness skin graft approach. Aside from scarring at the donor site, the split-thickness graft approach—unlike the Apligraf approach—results in atypical appearance and function; it also tends to cause malodor because the vagina is created using skin.

—Sharon Worcester

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