



BY CHARLES E. MILLER, M.D.

MASTER CLASS

Treating Ectopic Pregnancy

As editor of Master Class columns on gynecologic surgery, I am especially pleased to have Togas Tulandi, M.D., contribute this article on the current treatment of ectopic pregnancy. Dr. Tulandi is a professor of

ob.gyn. and the Milton Leong Chair in Reproductive Medicine (the first Canadian chair in reproductive medicine) at McGill University in Montreal.

As a clinical researcher, Dr. Tulandi has been quite pro-

lific. He has published more than 200 articles, 250 abstracts, 40 book chapters, and eight books. Dr. Tulandi also is the current president of the Society of Reproductive Surgeons, an affiliated society of the American Society for Reproductive Medicine.

As the readership no doubt will observe, Dr. Tulandi has a rather conservative view of treatment of ectopic pregnancy with medical therapy (methotrexate). Moreover, he provides valid reasons why laparoscopy is considered the preferred surgical treatment for ectopic pregnancy.

Although Dr. Tulandi points out that data are lacking

when deciding between salpingectomy vs. salpingostomy, he does provide reasonable recommendations to assist in deciding between the two procedures.

In addition, Dr. Tulandi shares valuable insight on interstitial pregnancy as well as persistent ectopic pregnancy.

Once again, I am very proud to have Dr. Tulandi's involvement with OB.GYN. NEWS and the Master Class.

DR. MILLER, a reproductive endocrinologist in private practice in Arlington Heights, Ill., and Naperville, Ill., is the medical editor of this column.

Surgical Treatment Calls For Minimally Invasive Techniques

As in many other areas of medicine, we are treating more patients with ectopic pregnancy medically than surgically. But not all women are good candidates for medical therapy; some undergo surgical therapy by necessity, and some by choice.

Surgery should be considered only in women who are hemodynamically stable and whose transvaginal ultrasound (TVUS) examination shows a tubal ectopic pregnancy or an adnexal mass suggestive of ectopic pregnancy. If TVUS does not show an abnormality, it is unlikely that an ectopic pregnancy will be visualized or palpated at surgery.

Moreover, when we need to treat surgically, we can and should use minimally invasive techniques whenever possible.

Alternatives to Surgery

Expectant management is the least desirable option because of the risk of tubal rupture. I take this approach only when I suspect ectopic pregnancy but TVUS fails to show the location of the gestational sac, and the serum levels of β -HCG are low and declining. Because of the possibility of tubal rupture, these patients must be carefully monitored until the serum β -HCG concentration falls below 15 IU/L; at this point, almost all ectopic pregnancies resolve spontaneously, without rupture.

Expectant management is never the best treatment when we have a diagnosis of ectopic pregnancy.

With an expectant management approach, we must monitor patients closely with serial β -HCG measurements every 2-3 days and also employ TVUS. The combination can provide us with information on whether we're dealing with an ectopic pregnancy or a miscarriage. A serum β -HCG concentration that is low and fails to double over 2-3 days suggests that we are dealing with either an ectopic pregnancy or failing intrauterine pregnancy.

Be aware that tubal rupture has been reported in women with low, declining, or even undetectable β -HCG levels. Rupture is mainly a result of blood distending the tube.

Some physicians will do a D&C when they're unsure about an ectopic pregnancy, but I would argue against this. First, it's surgery. Second, methotrexate (MTX) treatment has minimal side effects. Because a single intramuscular injection of

methotrexate is safe, I would argue that it is the better alternative.

It can even be reasonably argued that MTX administration is a better approach to management than is expectant management. However, we have to make sure that the possibility of viable intrauterine pregnancy has been eliminated.

When MTX is administered to properly selected patients, it has a success rate up to 94%. Several randomized studies have even found that MTX treatment in selected patients with ectopic pregnancy was as effective as laparoscopic treatment.

MTX should be given to women who are hemodynamically stable and who are willing and able to comply with posttreatment monitoring; who have an initial serum β -HCG concentration lower than 5,000 IU/L; and who have no ultrasound evidence of fetal cardiac activity.

The main factor in determining who is a candidate for MTX is the level of β -HCG. A fairly recent metaanalysis of data for 1,327 women with ectopic pregnancy who were treated with MTX showed that success of the therapy was inversely associated with β -HCG levels, and that increasing levels were significantly correlated with treatment failure.

In general, if the β -HCG level is higher than 5,000 IU/L, the failure rate of therapy is significantly higher.

But other factors are important as well. Treatment failure is also associated with fetal cardiac activity. And you most certainly do not want to give MTX to a patient whom you won't see for 3 months.

Recent evidence suggests that tubal diameter or fetal size does not predict the success of medical treatment.

Laparoscopy: It's Clear

For those who do not meet the criteria for MTX administration—as well as for women who do not have timely access to a medical institution for management of tubal rupture and, of course, for women who have a ruptured ectopic pregnancy—surgery is necessary.

Three good prospective, randomized trials with a total of 231 women have

compared laparotomy with laparoscopy, and have found that laparoscopic surgery is superior. Laparoscopic treatment of ectopic pregnancy resulted in less blood loss, lower analgesic requirements, shorter operative times, and briefer hospital stays. The studies also showed similar reproductive outcomes—subsequent uterine pregnancy and repeat ectopic pregnancy—after salpingostomy by either approach.

A Cochrane review published in 2000 also concluded that laparoscopic surgery is the best treatment. It reported a higher rate of persistent trophoblast with laparoscopic surgery, but concluded this was outweighed by the benefits of the more conservative laparoscopic approach. As I see it, the incidence of persistent trophoblast is related

to the laparoscopic experience of the surgeon.

When a patient is unstable or in shock, I stabilize the patient first and then consult with the anesthesiologist to see if he or she is comfortable with my doing laparoscopy. In my experience, most will offer their support for a laparoscopic approach.

Most ectopic pregnancies—even interstitial pregnancy, heterotopic pregnancy, and ectopic pregnancy in the presence of hemoperitoneum—can be treated through a laparoscopic procedure. Your approach, of course, should depend upon your experience and the judgment of the anesthesiologist.

To Spare the Tube or Not

When it comes to choosing salpingostomy or salpingectomy, there are some uncertainties, and we face an absence of data from randomized studies. In some—but not all—of the nonrandomized studies that have been done, the intrauterine pregnancy rate has been higher after the tube-sparing surgery than after salpingectomy. However, the risk of recurrent ectopic pregnancy has been shown to be slightly higher after the more conservative treatment.

These differences most likely reflect tubal status and not the choice of surgical procedure. In other words, contralateral

tubal abnormalities predispose patients to recurrent ectopic pregnancy regardless of the type of surgery. In one study of women who underwent laparoscopic salpingectomy, rates of intrauterine pregnancy and recurrent ectopic pregnancy were better among women who had normal contralateral tubal anatomy and no history of infertility (approximately 75% and 10%, respectively), compared with women who had abnormal tube anatomy or infertility (37% and 18%, respectively).

In the absence of data from a randomized study, though, salpingostomy should be the treatment of choice, particularly for women who want another pregnancy. I do not remove the tube in patients who wish to conceive again, provided the tube is relatively normal by gross inspection. If the patient has completed her family, I will remove the tube.

Some other ectopic pregnancies are often best treated by salpingectomy. These include cases of uncontrolled bleeding, a severely damaged tube, most cases of recurrent ectopic pregnancy within the same tube, and a tubal gestational sac larger than 3 cm in diameter. In these cases, the probability of normal tubal function in the future is low, and the likelihood of recurrent tubal problems is high.

Salpingostomy Technique

Laparoscopic salpingostomy is fairly straightforward. First, inject a dilute solution of vasopressin (0.2 IU/mL of physiologic saline) into the tubal wall at the area of maximal distention. This will minimize bleeding. Using a unipolar needle electrocautery (laser and scissors can also be used), make a 10- to 15-mm linear incision along the antimesenteric border overlying the ectopic site.

Do not use forceps and do not pull the products of conception out piece by piece, or you could cause more bleeding and mistakenly leave tissue behind. Instead, use a combination of hydrodissection with irrigating solution under high pressure and gentle blunt dissection with a suction irrigator. Remove the specimen from the abdominal cavity. A laparoscopic pouch can be useful for removing large pieces of gestational tissue.

Carefully irrigate the tube and make sure there is no bleeding. Control any bleeding points with pressure or with a

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BY TOGAS TULANDI, M.D.

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light application of bipolar coagulation. If bleeding persists, ligate the vessels in the mesosalpinx with a 6-0 polyglactin suture. The suturing is technically demanding, but this is one condition in which suturing skill is extremely helpful, and all laparoscopists should acquire it.

Do not keep coagulating the inside of the tube to stop the bleeding. The thermal damage will affect the integrity of the tube, and that integrity is important for future pregnancies.

Leave the incision open to heal by secondary intention. A randomized study I led several years ago showed no difference in the rates of adhesion formation and subsequent fertility between patients who had suturing after laparotomy and those who did not. If there is no difference after laparotomy, then the outcomes associated with secondary intention and primary closure after laparoscopy will also be similar.

Some physicians have proposed giving women MTX right after surgery. Although I do not recommend administering MTX prophylactically, it might be worthwhile to administer one dose of MTX in those rare cases in which you suspect that you might have left behind some gestational tissue.

Salpingectomy Technique

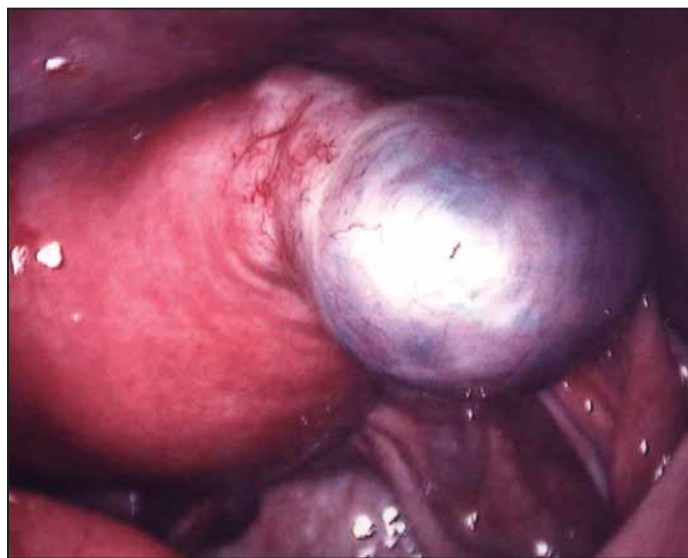
There are several methods for laparoscopic salpingectomy. For one, you may ligate the part of the tube that contains the ectopic pregnancy, then resect and remove the tube.

Alternatively, use electrocautery to coagulate the tube and mesosalpinx and then resect the specimen with scissors. The cornual portion of the tube should be desiccated close to the uterus. Elevate the tube when using the electrocautery, or you may inadvertently damage the ovarian vessels. You may perform either partial or segmental salpingectomy using a laparoscopic approach.

Regardless of the method of treatment, always check the patient's blood group. If she is Rh negative and the male partner's Rh factor is positive or unknown, the patient should be given RhoGAM.

Interstitial Pregnancy

Especially among patients who have had



A large ischemic ectopic pregnancy can be painful emotionally as well as physically.

in vitro fertilization (IVF), you may encounter interstitial pregnancy. The conventional treatment is hysterectomy or cornual resection. But with earlier diagnosis using TVUS and β -HCG assays, it can be diagnosed early and treated medically or laparoscopically.

Start with medical treatment and resort to surgery if there is any deterioration in clinical status. There are several options for surgery, including laparoscopic cornual resection, cornuostomy, or salpingotomy. In most cases, you will want to use dilute intramyometrial vasopressin at the start of the surgery to minimize blood loss. And remember the value of suturing and the option of achieving hemostasis by ligating the ascending branches of the uterine vessels.

If you perform surgery, make sure you have expertise in suturing, because you will be working in a very vascular area. Be comfortable with the procedure you are doing. I prefer laparoscopic removal of the gestation, with removal of the interstitial portion of the tube if necessary.

The risk of uterine rupture in future pregnancies after medical treatment of an interstitial pregnancy is unknown, as is the future integrity of the uterus following laparoscopic surgical treatment. We may be able to prevent future uterine rupture with proper suturing of the uterine cornu after laparoscopic treatment. Nevertheless, discuss the possibility of rupture oc-

curing during a subsequent pregnancy with patients undergoing any treatment for interstitial pregnancy.

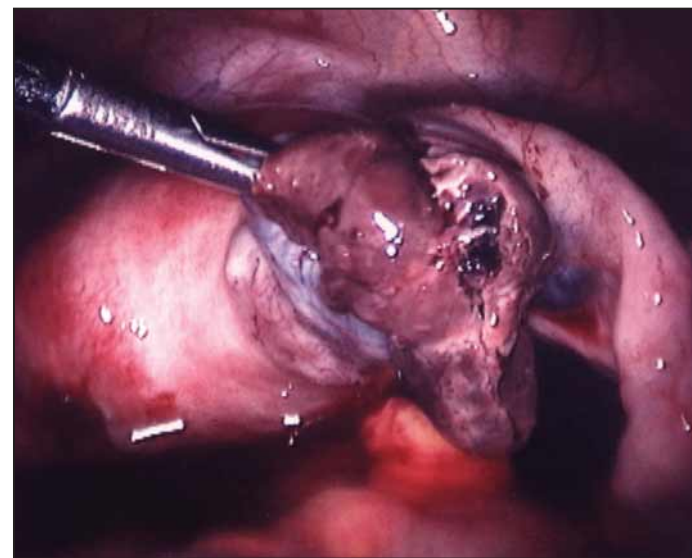
Likewise, monitor women with a history of interstitial pregnancy very closely. I usually recommend cesarean delivery to avoid potential uterine rupture during labor.

With any pregnancy after IVF, make sure that an ectopic pregnancy is not accompanied by pregnancy in the uterus. If you see both, you should not even consider medical therapy.

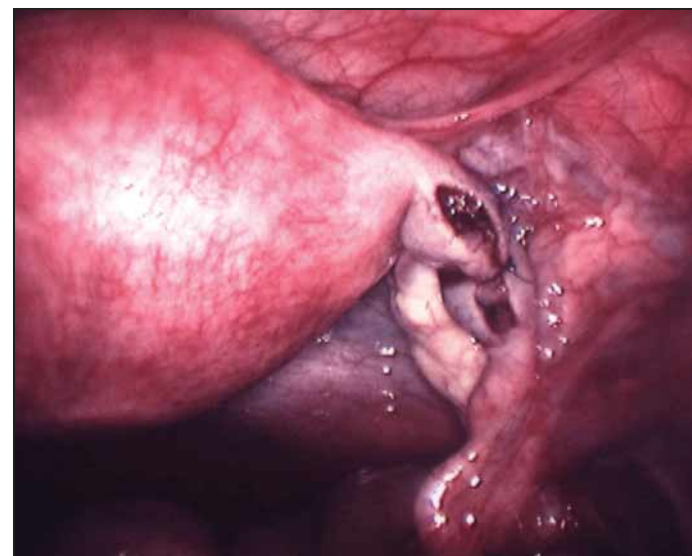
Persistent Ectopic Pregnancy

Persistent ectopic pregnancy occurs more often after salpingostomy performed with laparoscopy than after salpingostomy through laparotomy (about 8% compared with 4%). The difference used to be much greater and probably reflects the surgeon's learning curve.

Some authors have recommended weekly serum β -HCG measurements af-



Salpingostomy has been performed and the ectopic gestation extruded outside the fallopian tube.



One suture to approximate the tubal incision has been placed, a step that requires exacting skill.

ter laparoscopic salpingostomy to exclude persistent ectopic pregnancy. We perform a single serum β -HCG measurement 1 week after surgery. If the level is more than 5% of the preoperative value, we will repeat the measurement 1 week later.

If the level does not decline after the second week, we administer a single dose of MTX (50 mg/m² intramuscularly). We then perform TVUS examination and measure serum β -HCG concentrations weekly until the level is lower than 10 mIU/mL. ■

Thermoablation: 73% Have Reduced Dysmenorrhea at 3 Years

BY DOUG BRUNK
San Diego Bureau

SAN DIEGO — Thermal balloon endometrial ablation is a safe and effective option for the treatment of women with idiopathic menorrhagia, results from a 3-year study of 330 women have shown.

"The procedure is simple, does not require additional training in operative hysterectomy, and compares favorably with other ablative techniques," Stefanos Chandakas, M.D., Ph.D., reported at an international congress of the Society of Laparoendoscopic Surgeons. "These good results, however, need to be confirmed in

a randomized, controlled trial."

He and his associates used a 6-mm diameter Cavaterm Plus thermoablation system in 330 women with a mean age of 42 years. All participants had experienced heavy menstrual bleeding, failed medical treatment for the condition, and otherwise would have required hysterectomy, endometrial laser ablation, or endometrial resection.

The outpatient procedures were performed from January 2001 to June 2004 at Princess Royal University Hospital and Farnborough Hospital, Orpington, England. Contraindications included undiagnosed uterine bleeding, pregnancy or the desire to become pregnant, atypical

endometrial cells, cervical length greater than 6 mm, a uterine cavity less than 4 cm or greater than 10 cm, uterine wall weakness, and ongoing infection.

No endometrial preparation was used. Each ablation lasted 10 minutes at a temperature of 78° C. Follow-up occurred at intervals of 3, 6, 12, 24, and 36 months, for a mean of 22 months.

Nearly half of the participants (48%) were amenorrheic after 1 year, while the rates of amenorrhea were 39% and 38% after 2 and 3 years, respectively. (See chart.)

The majority of women (83%) reported a reduction in dysmenorrhea and premenstrual symp-

oms at 1 year, "which is a recognized and consistent finding following endometrial destructive procedures," said Dr. Chandakas of the minimal access unit in the department of obstetrics and gynecology at Princess Royal.

At 3 years, 73% of women re-

ported a reduction in dysmenorrhea and premenstrual symptoms. No balloons failed, and no major complications were noted.

Dr. Chandakas disclosed that he has no financial interest in Wallsten Medical, the Swiss manufacturer of Cavaterm Plus. ■

Thermal Balloon Endometrial Ablation

Follow-Up	Amenorrhea	Hypomenorrhea
6 months (n = 321)	61%	22%
12 months (n = 289)	48%	27%
18 months (n = 193)	42%	31%
24 months (n = 132)	39%	35%
36 months (n = 91)	38%	35%

Source: Dr. Chandakas