Contemporary Management of Ectopic Pregnancies

Ana Alvarez Murphy and Sujatha Reddy

Introduction

The incidence of ectopic pregnancies has increased fourfold since 1970. Ectopic pregnancy now accounts for roughly 1.2% to 1.4% of reported pregnancies. This may be the consequence of our ability to treat pelvic inflammatory disease (PID) effectively before permanent tubal obstruction occurs or it may be a reflection of the general trend toward delayed childbearing. Early diagnosis and treatment have reduced mortality and morbidity, as well as probably improving subsequent fertility. Advances in ultrasound, particularly transvaginal imaging, and human chorionic gonadotropin (β-hCG) detection have considerably improved our diagnostic capability. Laparoscopy is an integral part of the diagnostic scheme and recently has become the preferred therapeutic method when surgery is required. Depending on the patient’s desire for future fertility and the extent of her disease, conservative as well as radical surgery may be performed laparoscopically.

Diagnosis of Ectopic Pregnancies

If an ectopic pregnancy is diagnosed early, it can usually be treated before significant tubal destruction and hemorrhage occur. Those patients with significant risk factors, including previous pelvic inflammatory disease, tubal surgery, or history of ectopic pregnancy, should be screened early in the course of pregnancy with serial serum β-hCG measurements and transvaginal ultrasound to confirm the intrauterine location of the gestation. Patients of childbearing age who present with pelvic pain or abnormal vaginal bleeding should be screened with a rapid and sensitive monoclonal antibody urine β-hCG test. With test sensitivity currently averaging 20 mIU/ml, the false-negative rate is about 1%. In a hemody-
namically unstable and symptomatic patient with a positive urine pregnancy test and a positive culdocentesis for free-flowing nonclotting blood, one should proceed directly to laparoscopy or laparotomy, depending on the skill and experience of the surgeon.

In the hemodynamically stable patient with a positive \( \beta \)-hCG and pelvic pain, a transvaginal sonogram should be performed to evaluate the uterine and adnexal structures initially. If an intrauterine sac is not seen and a complex adnexal mass is noted on sonography, the patient is taken to laparoscopy, because this clinical picture is highly predictive of an ectopic pregnancy. Alternatively, patients suspected of having an ectopic pregnancy but who are pain free and do not demonstrate a gestational sac or complex adnexal structure by sonogram may be followed carefully with serial quantitated serum \( \beta \)-hCG measurements. Laparoscopy is usually indicated if the initial \( \beta \)-hCG is greater than 2000 mIU/ml and no intrauterine sac is seen on the transvaginal sonogram.\(^5\) Transvaginal sonography can image a 3-mm intrauterine gestational sac, generally correlated to serum \( \beta \)-hCG levels as low as 1000 to 2000 mIU/ml (by the International Reference Preparation [IRP] standard). If the initial \( \beta \)-hCG is less than 2000 mIU/ml, the differential diagnosis includes an early intrauterine or ectopic pregnancy, and the \( \beta \)-hCG level is repeated in 48 hours.

Normally, at least a 66% rise in \( \beta \)-hCG level is observed if a normal intrauterine pregnancy is present. An abnormal increase, plateau, or decrease in the quantitated pregnancy test denotes an abnormal gestation—either a spontaneous or threatened abortion or an ectopic pregnancy. A dilatation and curettage (D&C) may be performed to detect the presence of intrauterine chorionic villi, either grossly (e.g., by flotation of the specimen in sterile water) or on frozen/permanent section. If no villi are found at D&C, laparoscopy is recommended unless the clinical setting is highly suggestive of a complete spontaneous abortion or the \( \beta \)-hCG levels continue to fall toward negative. With this algorithm most ectopic pregnancies can be diagnosed early, minimizing tubal damage and patient morbidity. The most common differential diagnosis for an ectopic pregnancy is a threatened abortion. The most common differential diagnosis when the ultrasound shows an adnexal mass is an intrauterine pregnancy with a bleeding corpus luteum cyst(s).

### Patient Selection and Prerequisites for Laparoscopic Surgery

To perform laparoscopic surgery safely for ectopic pregnancy, one must have a skilled surgeon, an appropriately selected patient, and the appropriate instrumentation. The most important requirement for the laparoscopic treatment of ectopics is surgical experience. Because laparoscopic surgery involving small ectopic pregnancies is relatively easy to perform, many surgeons begin their training treating these pregnancies, which is quite appropriate in the stable patient so long as an experienced surgeon is on hand to supervise. However, it is inappropriate for a novice to operate on a hemodynamically unstable patient.

Contraindications to laparoscopic treatment, particularly in regard to size and location of the ectopic, are relative depending on the experience and skill of the surgeon. Nevertheless, an intramural ectopic may be more difficult to manage than an isthmic or ampullary tubal pregnancy. Although excessive size of the pregnancy has been mentioned as a relative contraindication, this depends more on the surgeon’s ability to identify the pelvic anatomy clearly. Reich and colleagues reported on the laparoscopic treatment of 109 ectopic pregnancies\(^6\); 16 ectopic pregnancies were ruptured, 3 had unstable vital signs, and 3 were interstitial. There were no intraoperative complications, and no laparotomies were performed.

### Techniques and Instrumentation

#### Instrumentation

Many operative laparoscopic instruments are available for the treatment of ectopic pregnan-