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# The Role of Laparoscopy in the Management of the Infertility Patient

Thomas S. Kosasa, MD

*Laparoscopy has traditionally been used only as a diagnostic step in the evaluation of the infertility patient. With the advent of more sophisticated instrumentation including the use of laser surgery, laparoscopic procedures can now be performed instead of conventional laparotomy.*

*Lysis of pelvic adhesions as well as treatment of endometrial implants and endometriomas are now routine laparoscopic procedures with improvement in pregnancy rates comparable to microsurgery. New advances in instrumentation will increase the pregnancy rate following laparoscopic tubal surgery as well as laparoscopic assisted In Vitro Fertilization, and will also increase the safety of this procedure.*

Traditionally, laparoscopy has been performed as the final step in the infertility investigation. It was felt that if the history, pelvic examination, and hysterosalpingogram did not suggest the presence of pelvic pathology, the likelihood of an abnormality being found would be small and that controlled ovarian stimulation and timed insemination would result in an acceptable pregnancy rate.<sup>1</sup>

Recently it has been shown that the hysterosalpingogram although less invasive cannot adequately assess the pelvis and should

be considered complementary to laparoscopy rather than competitive with it.<sup>2</sup> Pelvic adhesions are especially difficult to diagnose with the hysterosalpingogram but can be easily seen through the laparoscope. More important, pelvic adhesions can be treated with the use of the laparoscope. The association between pelvic adhesions and reduced pregnancy rates has been well established. Studies have shown that pregnancy rates following lysis of comparable adhesions have resulted in a pregnancy rate of 45% compared to 16% in patients who did not have any corrective surgery.<sup>3</sup> Pregnancy rates following laparoscopic lysis of adhesions have shown to be comparable to lysis of adhesions by microsurgery.<sup>4</sup>

Endometriosis has always been a major factor in the etiology of infertility and the incidence has been shown to be as high as 48% in an infertile population. Several modalities have been advocated for the treatment of endometriosis. These have included surgery, medical therapy, or expectant management. Expectant management has been widely used for the patient with minimal endometriosis since it has been shown that an acceptable number of patients with mild disease will conceive without any treatment.

Recently this approach to minimal endometriosis has been reassessed. The Canadian Collaborative Group on Endometriosis published an article in the July 1997 issue of *The New England Journal of Medicine*.<sup>5</sup> Results from their work suggested a substantial increase in the pregnancy rates following treatment of mild endometriosis. Patients were treated with either electrocoagulation or laser vaporization of endometrial implants. Studies in the past have shown laparoscopic surgery to be superior to medical treatment or expectant management in terms of pregnancy success, but this was the first study to provide useful figures to corroborate the increased pregnancy rates following laparoscopic treatment of minimal endometriosis.

With moderate or severe endometriosis, there is widespread agreement that surgical treatment is superior to medical therapy since most of these patients have pelvic adhesions. In these patients, elimination of endometriosis as well as restoration of normal pelvic anatomy is the final goal of laparoscopic surgery. The surgical treatment consists of removal of implants by excision, electrocoagulation, or laser vaporization, as well as lysis of adhesions and excision of endometriomas. Although use of the laser is the treatment of choice, many surgeons believe that the success rate is dependent on the completeness of the surgery rather than the specific energy source.<sup>6</sup>

All large endometriomas should be completely excised since aspiration alone results in a recurrence of the endometrioma.<sup>7</sup> Medical suppression is also inadequate for the same reason since the endometrioma will reform following cessation of medical therapy. Smaller endometriomas can be either excised or thoroughly coagu-

Correspondence to:  
Thomas S. Kosasa, MD  
Department of Obstetrics and Gynecology  
John A. Burns School of Medicine  
1319 Punahou Street, #1040  
Honolulu, Hawaii 96826

lated with electrocautery. Laser coagulation does not have the depth to completely destroy the cyst wall of an endometrioma.

Tubal surgery can be accomplished through operative laparoscopy with similar success rates compared to traditional microsurgery. These procedures can be classified into fimbrioplasties, salpingostomies, or salpingo-ovariolysis. A fimbrioplasty or deagglutination of the fimbria is accomplished by inserting a small forcep through the stenotic distal opening of the tube and dilating the jaws to separate the agglutinated fimbria. The pregnancy rates following this procedure have been very acceptable.<sup>8</sup> Salpingostomy or the opening and eversion of a completely occluded tube is more complex and requires the skill of an experienced laparoscopic surgeon. Recent results have shown that pregnancy rates following laparoscopic surgery for complete distal tubal obstruction have been comparable with pregnancy rates following traditional microsurgery.<sup>9</sup>

Laparoscopic procedures to induce ovulation in patients with the polycystic ovarian syndrome have been introduced as an alternative to ovarian wedge resection. The mechanism for resumption of ovulation following ovarian cortical injury is unknown, but most procedures have shown a reduction of ovarian androgen levels.<sup>10</sup> The most widely used laparoscopic procedure has been to drill holes in the ovarian cortex using the unipolar probe. The success rate appears to be higher with an increase in the destruction of the ovarian cortex. Studies have shown that the ovulation rate was 67% when less than six holes were drilled, and 97% when more than ten holes were drilled.<sup>11</sup> Adhesion formation has been reported following the ovarian drilling procedure, so use of a cellulose barrier such as Interceed to cover the ovary has now been a standard part of this procedure.<sup>12</sup>

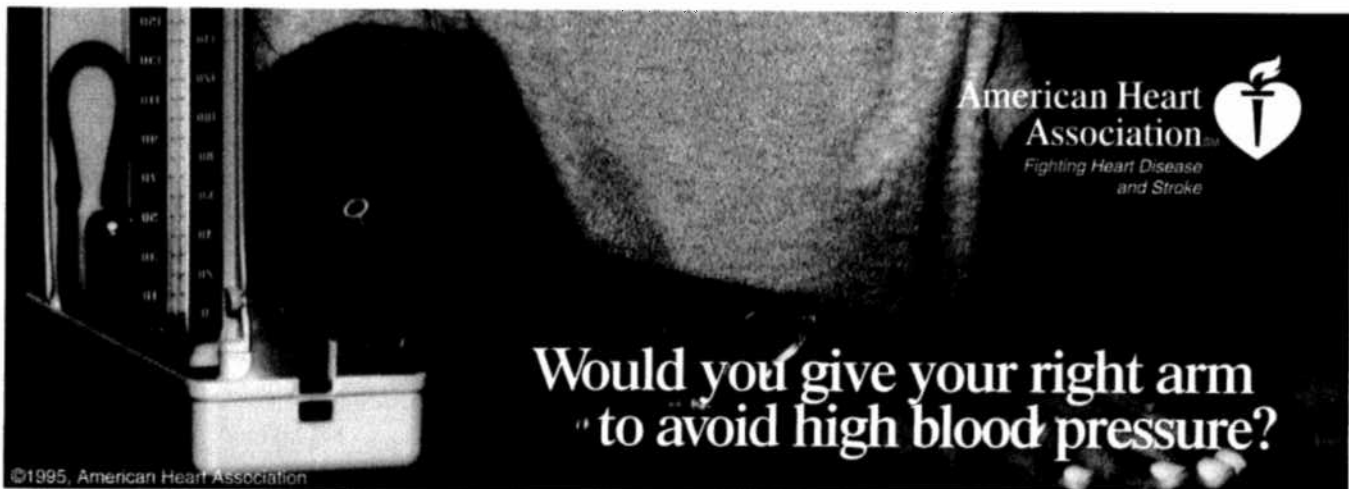
Laparoscopy can also be used in conjunction with certain In Vitro procedures. Although ultrasound guided needle aspiration of the ovary has been the preferred method for obtaining ova, recent evidence suggests that treatment of pelvic infertility factors at laparoscopy such as adhesions and endometriosis may be combined successfully with oocyte retrieval without compromising preg-

nancy rates.<sup>13</sup> Laparoscopy has also been used in the more traditional role for the replacement of pre-embryos in the zygote intrafallopian tube (ZIFT) procedure or for the replacement of gametes in the gamete intrafallopian tube (GIFT) procedure.

With the advent of new instrumentation the use of the laparoscope in the management of the infertility patient will be expanded especially with the introduction of three dimensional cameras that allow greater depth perception, and through the use of ultrasonic scalpels and coagulators which may eventually replace the use of electrocautery and laser. Continuous evaluation and improvement of laparoscopic procedures and equipment will result not only in an increase in the present pregnancy success rate, but will also increase the safety rate of this procedure.

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