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Videolaseroscopy for oophorectomy

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Laparoscopic oophorectomy was performed on 94 ovaries in 76 patients. Indications included recurrent pain associated with endometriosis and adhesions in 17 patients (18 ovaries), ovarian endometriomas in 40 patients (40 ovaries), prophylactic oophorectomy (breast cancer) in one patient (2 ovaries), removal of the ovaries at the time of laparoscopic assisted vaginal hysterectomy in 15 patients (30 ovaries), and other indications in three patients (four ovaries). (Am J Obstet Gynecol 1991;165:1323-30.)

Key words: Operative laparoscopy, oophorectomy, videolaseroscopy, avoiding laparotomy, laparoscopy

Operative laparoscopy has been shown to be a safe, useful, and cost-effective alternative to laparotomy in cases of benign pelvic disease.[1-10] An increasingly wider variety of procedures are becoming possible, when performed by experienced operative laparoscopists.

Oophorectomy at laparoscopy with the use of endoloop suture has been previously reported.[3] This report presents our experience with an alternative technique, videolaseroscopy (a combination of high-resolution video imaging and high-power carbon dioxide laser applied to operative laparoscopy) and electrocoagulation, to accomplish 94 consecutive oophorectomies.

Material and methods

All operations were performed by two surgeons (C.N. and F.N.), who have a combined experience of >5000 operative laparoscopies. All patients were seen in a private, largely referral clinical practice and operated on in an outpatient surgical suite of a large suburban hospital. From July 1987 to June 1990, laparoscopic oophorectomy, with videolaseroscopy techniques only, was performed on 94 ovaries in 76 patients ranging in age from 32 to 60. Indications were recurrent pain associated with endometriosis or pelvic adhesive disease, ovarian endometrioma (6 to 15 cm diameter), persistent ovarian cyst, prophylactic oophorectomy in breast cancer, and oophorectomy at the time of laparoscopically assisted vaginal hysterectomy; all patients undergoing laparoscopically assisted vaginal hysterectomy had a history of endometriosis, adhesions, or leiomyomas, which precluded straightforward vaginal hysterectomy. Forty-eight patients had an intact uterus, whereas 28 had had hysterectomy. Tables I, II, and III summarize the clinical data regarding these 76 patients.

Table I. Indications for oophorectomy in 76 women

Indications	*No. of patients*	*No. of ovaries*	*Age of patient (yr)*
Endometrioma	40	40	32-43
Severe endometriosis and adhesions	17	18	36-49
Laparoscopically assisted vaginal hysterectomy	15	30	39-47
Ovarian cyst	3	4	32-52
Prophylactic oophorectomy	1	2	42
TOTAL	76	94	

All patients with endometriosis or adhesions had previous medical or conservative surgical management that failed to relieve pain. The history was reviewed preoperatively, including previous operative reports, and pelvic examination and ultrasonographic examination were performed. Cases with unilocular ovarian cysts were initially managed by suppressive therapy with 50 μg estinyl estradiol–containing oral contraceptives or danazol. CA 125 levels were obtained for all patients beginning in 1988. Intraoperatively, the pelvis, upper abdomen, and diaphragmatic surfaces were inspected for signs of malignancy, and pelvic washings were obtained for cytologic testing. The cyst was then aspirated, and the fluid was examined grossly and sent for cytologic examination. The cyst wall was then opened and inspected for excrescences or irregular thickenings. Frozen-section histologic examination was done if, in

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Table II. Oophorectomy in 48 women with intact uteri

	No. of patients	*No. of ovaries*
Laparoscopically assisted vaginal hysterectomy	15	30
Endometrioma	29	29
Breast cancer	1	2
Persistent functional cysts	1	2
Serous cystadenoma	1	1
Dermoid cyst	1	1
TOTAL	48	65

Table III. Oophorectomy in 28 women after hysterectomy

	No. of patients	*No. of ovaries*
Endometriosis and adhesions	17	18
Endometrioma	11	11
TOTAL	28	29

the judgment of the surgeon, the appearance was suspicious. All tissue obtained was submitted for permanent-section histologic examination.

All procedures were performed with the patient under general endotracheal anesthesia. Multiple abdominal punctures were used to introduce the laparoscope and suprapubic instruments. A miniature laparoscope-mounted video camera with a high-resolution video monitor was used, allowing the operative field to be magnified and viewed by all operating room personnel and a more comfortable, upright position for the surgeon (Fig. 1). All procedures were video recorded to retain a permanent record on each patient. The carbon dioxide laser was introduced into the peritoneal cavity through the operating channel of the laparoscope with direct lens coupler and set at 30 to 80 W of power in superpulse mode for the purpose of cutting.[5, 9-12] Bipolar forceps were introduced through a suprapubic portal and used for coagulation.

After the pelvis and abdomen were explored, oophorectomy was carried out in the following manner: Adhesions between the ovary and adjacent organs, pelvic walls, and broad ligament were lysed with a carbon dioxide laser. A Nezhat suction-irrigator probe (Cabot Medical, Langhorne, Pa.) and later a Nezhat-Dorsey probe (Karl Storz, Culver City, Calif.), introduced suprapubically, were used as a backstop and to provide constant suction, irrigation, and smoke evacuation. When the ovary was adherent to the lateral pelvic wall and in cases with previous hysterectomy, the technique of hydrodissection[13] was used to open the peritoneum, beginning at the pelvic brim, and to identify the course of the ureter and major blood vessels. With the same techniques, the descending colon and rectosigmoid colon were dissected from the site of the left infundibulopelvic ligament and ovary. Ovarian cysts were then aspirated, allowing easier handling of the deflated cyst and smaller ovary. Once the ovary was completely mobilized, it was held under tension with a grasping forceps, and the ovarian ligament was coagulated with bipolar cautery and transected with the laser at its junction to the uterus (Fig. 2). With 20 to 25 W, the cautery was applied briefly, desiccating and blanching but not overdesiccating the tissue, to reduce the blood flow to the pedicle to be transected. The mesovarium was then serially blanched, coagulated, and transected at 1 to 2 cm increments, working from medial to lateral, until the ovary was removed (Figs. 3 to 5). When the ipsilateral fallopian tube also was removed, the isthmic portion of the tube was severed and incised along with the ovarian ligament (Fig. 6); after identification of the ureter, the infundibulopelvic ligament was coagulated and transected at 1 to 2 cm increments, working from lateral to medial, until the adnexa were removed as described above (Figs. 7 and 8).

In most cases the ovary was removed from the peritoneal cavity through a 10 mm trocar sleeve placed in one of the suprapubic puncture sites. The ovary was grasped with a forceps, and then forceps and sleeve were removed together, delivering the ovarian tissue to the abdominal wall, where it was then grasped by a Kelly clamp and removed. In 25 patients (one with serous cystadenoma, nine with endometriomas associated with myomectomy, and 15 with laparoscopically assisted vaginal hysterectomy) the tissue was removed by posterior colpotomy.[15] After removal of the ovary, thorough irrigation of the pelvic cavity was performed. The pedicles were then inspected under the water, both in the presence of a pneumoperitoneum and again after carbon dioxide evacuation, to ensure hemostasis after intraperitoneal pressure was reduced.

Results

Laparoscopic oophorectomy with the technique of videolaseroscopy was performed on 94 ovaries in 76 patients. The procedure was completed in each attempted case. Blood loss during oophorectomy was minimal. No major intraoperative or postoperative complications occurred, and no long-term complications have developed. No ovarian malignancies were encountered in this group of patients. Minor complications were limited to abdominal wall ecchymosis (two patients) and severe shoulder pain (nine patients).

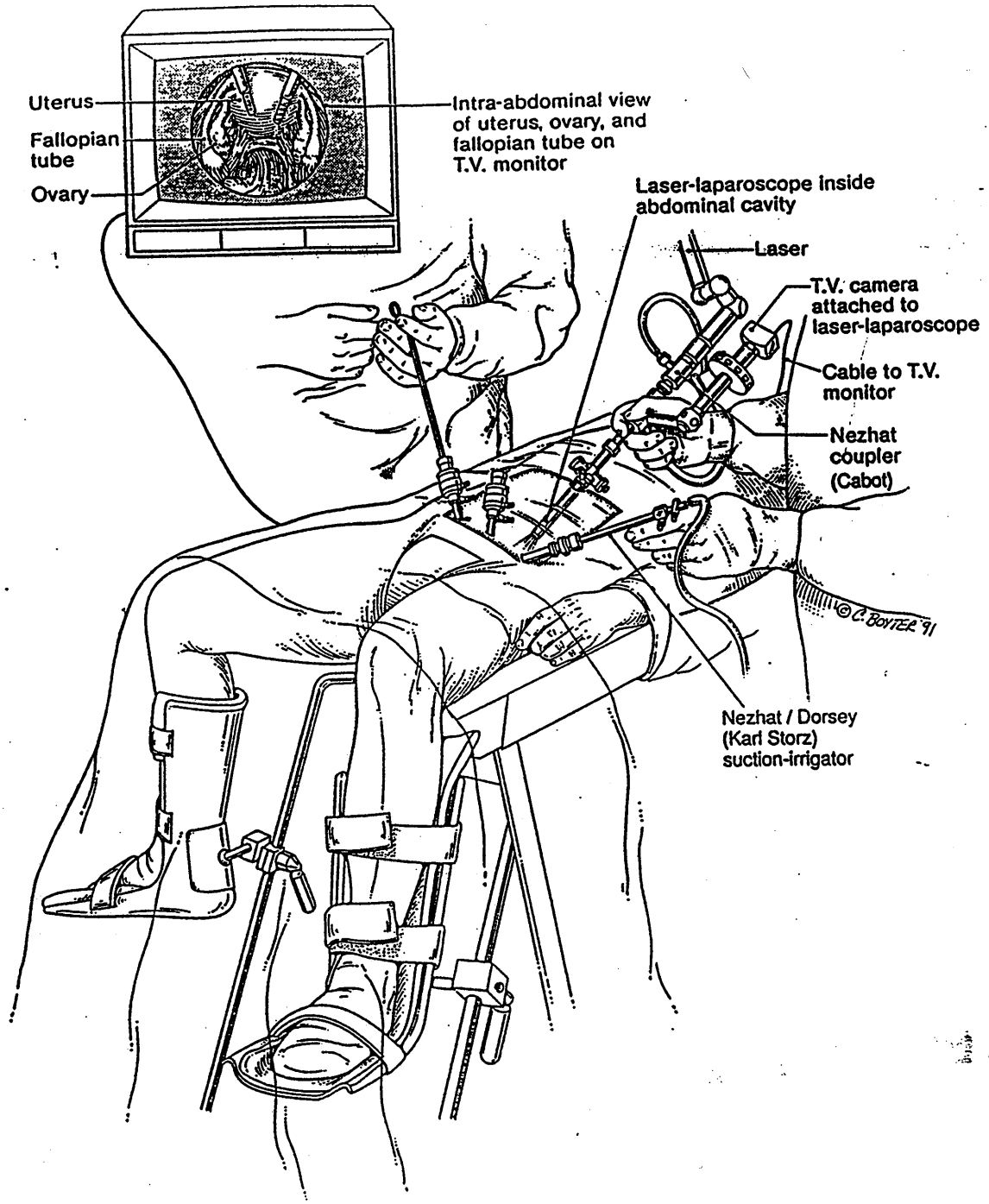

Fig. 1. Operating room setup.

The duration of oophorectomy was 22 to 55 minutes and was shortest in the patient requiring prophylactic oophorectomy, where no previous pelvic abnormality existed. Cases associated with myomectomy lasted 115 to 180 minutes, and laparoscopically assisted vaginal hysterectomy lasted 130 to 230 minutes.[14, 15] While patients with laparoscopically assisted vaginal hysterectomy were discharged on the second or third postoperative day, all other patients were discharged within 24 hours, requiring an average hospital stay of 8.5 hours.

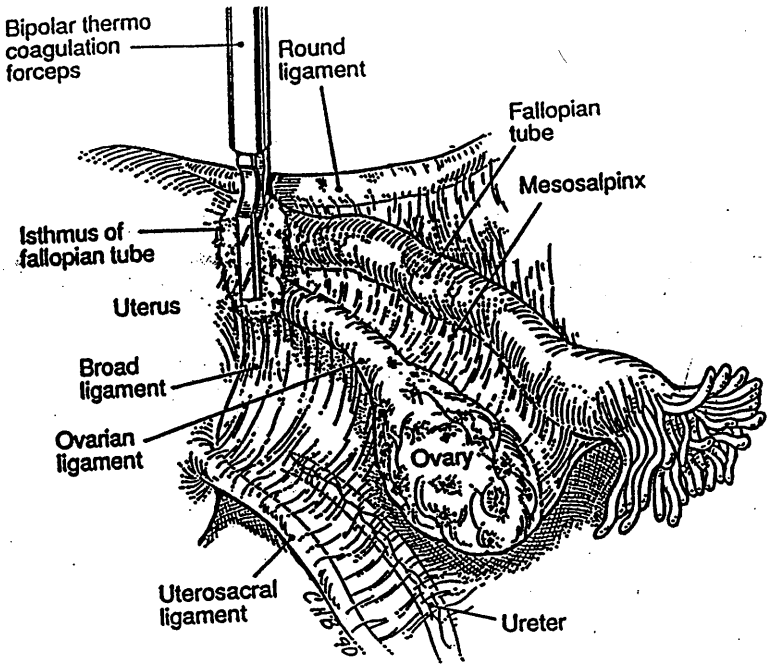

Fig. 2. Option 1: Coagulation of infundibulopelvic ligament adjacent to uterus.

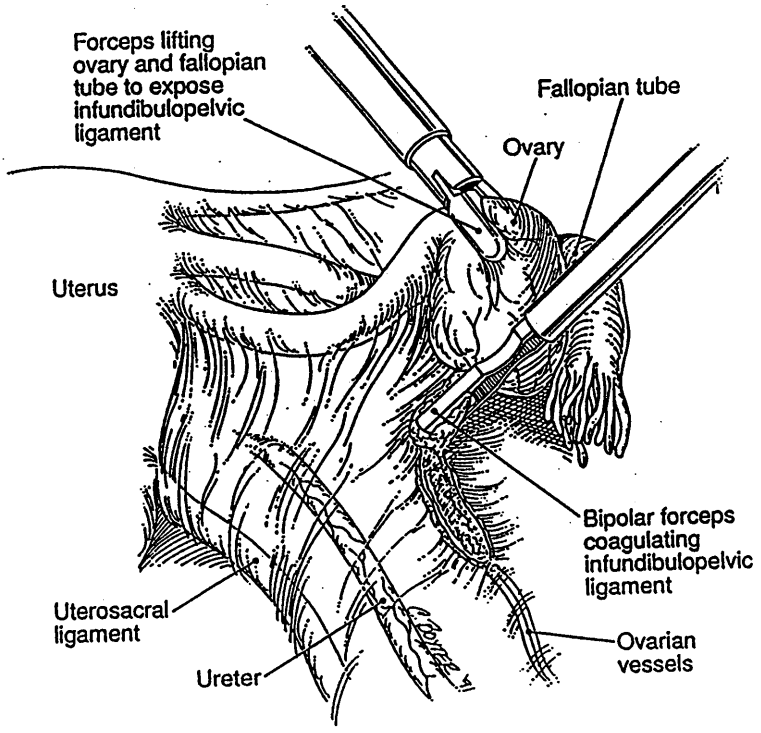

Fig. 3. Option 2: Coagulation if infundibulopelvic ligament distal to uterus.

Comment

Oophorectomy is frequently necessary in patients experiencing chronic pelvic pain because of adhesions or endometriosis unresponsive to conservative medical or surgical therapy. Large endometriomas and benign ovarian cysts can destroy normal ovarian tissue, and oophorectomy may be selected in these cases, at the judgment of the surgeon. In the past, laparotomy was

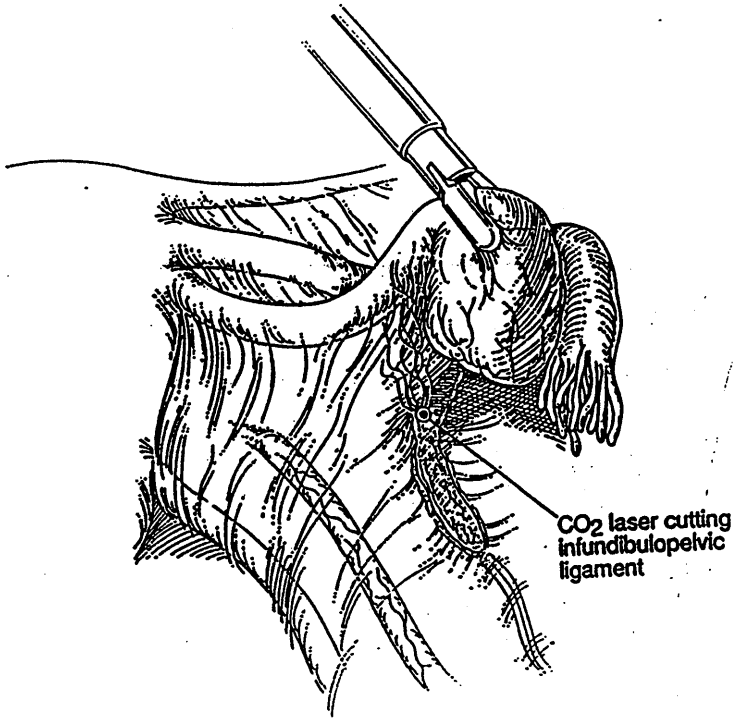

Fig. 4. Carbon dioxide laser used as a long knife through operative channel of laparoscope.

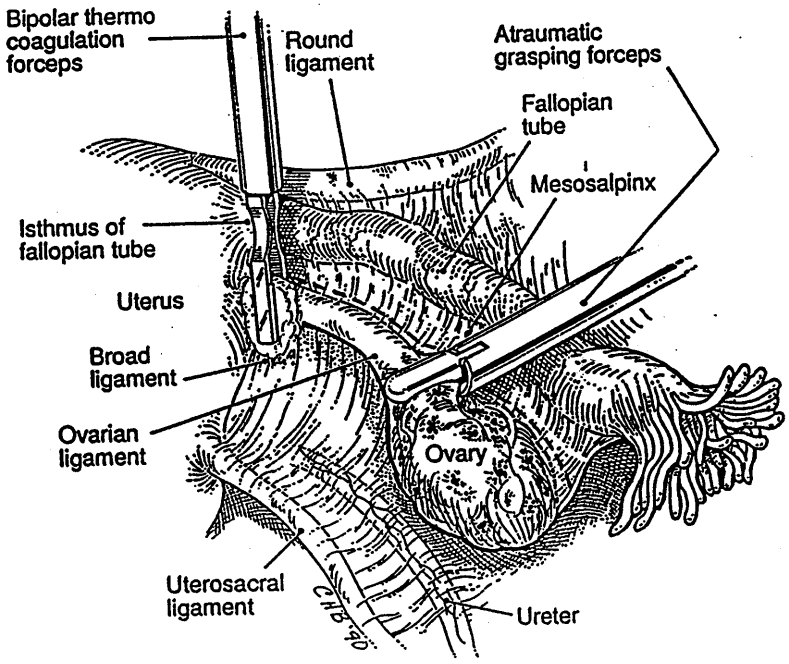

Fig. 5. Coagulation of ovarian ligament proximal to uterus.

the only surgical means to accomplish oophorectomy. Ovaries can now be removed at laparoscopy by experienced operative laparoscopists on an outpatient basis, resulting in shorter hospital stay, faster return to work, lower cost, and less adhesion formation.[16, 17]

Whereas laparoscopic oophorectomy has been reported with other techniques, videolaseroscopy offers some technical advantages to the operative laparoscopist. Perry and Upchurch,[18] using different instrumentations and techniques, performed oophorectomies in

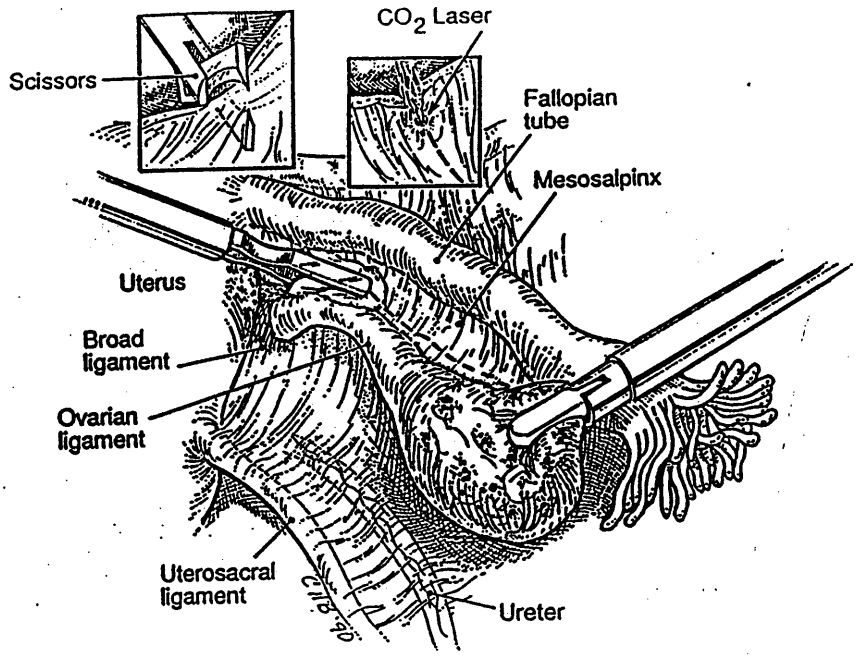

Fig. 6. Coagulation of ovarian ligament proximal to uterus.

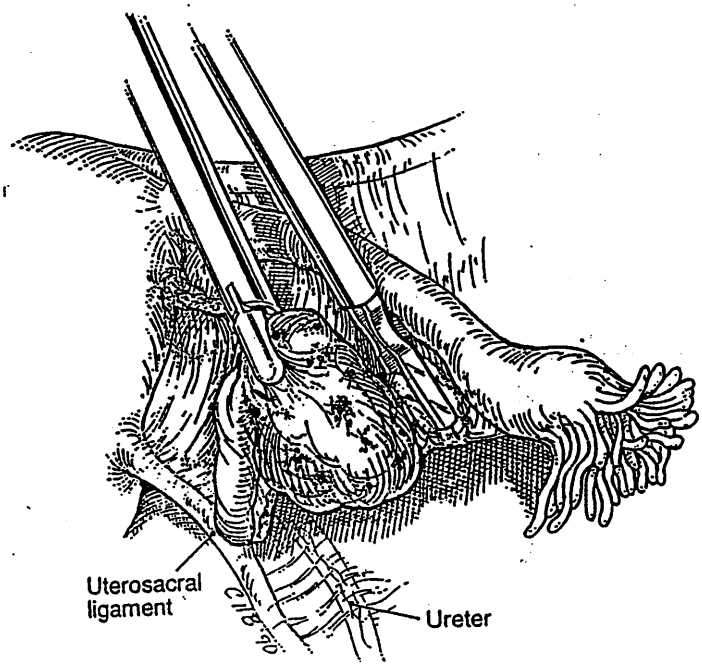

Fig. 7. Ovary has been freed from ureter and is under traction.

17 patients. One, with postoperative bleeding, required a laparotomy and transfusion. Six patients were excluded because of adhesions and an inability to visualize the ureter. In the majority of cases, pelvic adhesions must be lysed before the ovary can be mobilized, and ovarian anatomy is frequently distorted. Videolaroscopy using the carbon dioxide laser and hydrodissection are an excellent combination for lysis of adhesions and entering the retroperitoneum[19] to mobilize the ovary and remove it. In contrast, endoloop sutures cannot be applied in the presence of adhesions or distorted anatomy, and therefore additional instruments and techniques are required, thereby complicating the operating room setup. Furthermore, application of en-

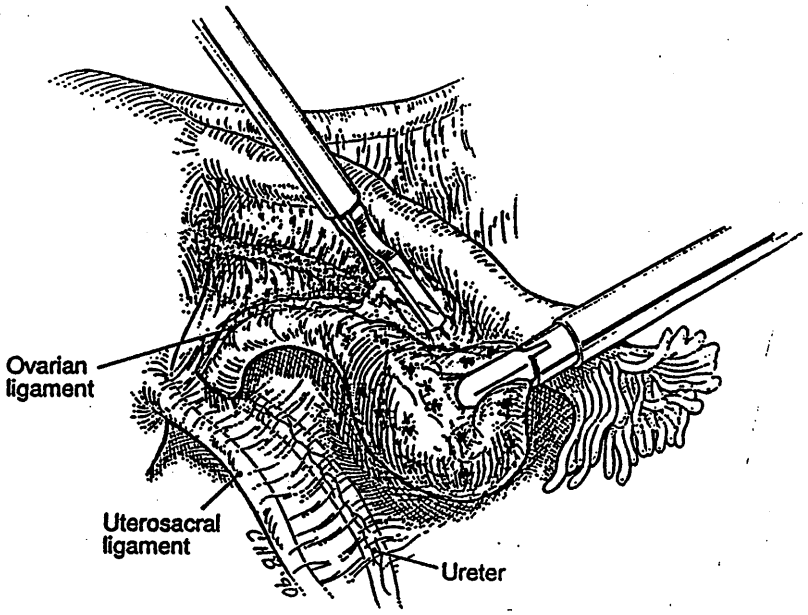

Fig. 8. Saving tube and removing ovary—position of ureter can be seen.

doloop sutures to large pedicles such as the mesovarium and infundibulopelvic ligament is awkward even in the absence of anatomic distortion. Once applied, the slipknot can easily loosen under the tension of this large pedicle, increasing the risk of intraoperative hemorrhage and occasionally leaving a piece of ovary, causing ovarian remnant syndrome.

Complete desiccation of tissues with bipolar cautery, by means of generator amp meter, has been suggested before transection of pedicles.[20] In our experience, however, desiccation to the point of blanching allows improved tissue healing without risk of hemorrhage. Overdesiccation (by allowing the amp meter to go to zero) creates friable tissue, which can actually predispose to intraoperative bleeding, and increased thermal damage that can theoretically produce postoperative adhesions. In addition, the pedals of the bipolar cautery device may stick to the tissue. Generators that provide a self-limiting bipolar desiccation mode minimize the chance for overdesiccation. Self-limiting bipolar cautery (Valley Lab Force series generators, Boulder, Colo.) provides controlled desiccation without charring the adjacent tissue. In this mode, the power peaks into a 100 Ω resistance instead of 300 to 500 Ω in typical generators. The power will then "roll off" at 1/resistance. This rapid but controlled "roll-off" provides the desired surgical effect without excess drying, blanching, or destruction of tissue.

Even after hemostasis has been achieved, in the presence of pneumoperitoneum, pedicles should be reinspected after evacuation of abdominal carbon dioxide. After intraabdominal pressure is lowered, ovarian pedicles have been noted to bleed again at termination of the procedure. This maneuver offers one additional safeguard for complete hemostasis.[21]

Use of the carbon dioxide laser as the cutting instrument eliminates the tedious sequence of coagulating, removing the forceps, and introducing the scissors repetitively. In contrast, the laser remains available to the surgeon, always ready as a long knife, along the line of vision of the laparoscope, is operated by foot pedal instead of an additional hand, and functions to replace the scissors and, in many instances, the bipolar cautery as well. Finally, the posterior blade of the scissors becomes obscured by the tissue about to be cut, whereas the laser beam remains in view at all times, thereby eliminating any blind surgical manipulation.

In these 76 patients there were no major complications. Minor complications were associated with the laparoscopic procedure and not the oophorectomy. When there is no contraindication to laparoscopy, oophorectomy can be safely performed by an experienced operative laparoscopist at the time of diagnostic laparoscopy.

Laparoscopic oophorectomy appears to be a safe alternative to laparotomy, offering all the advantages of an outpatient surgical procedure. The techniques of videolaseroscopy simplify oophorectomy for the experienced operative laparoscopist.

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Inappropriate secretion of antidiuretic hormone in Sheehan's syndrome: A rare cause of postpartum hyponatremia

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A 27-year-old woman experienced hemorrhagic shock after delivery. One week later she was seen in an obtunded state of consciousness. The results of laboratory evaluation were consistent with the syndrome of inappropriate antidiuretic hormone secretion caused by hypopituitarism. Hydrocortisone rapidly corrected sodium levels. Syndrome of inappropriate secretion of antidiuretic hormone caused by Sheehan's syndrome should be considered in the differential diagnosis of postpartum hyponatremia. (Am J Obstet Gynecol 1991;165:1330-3.)

Key words: Antidiuretic hormone, hyponatremia, Sheehan's syndrome

Postpartum anterior pituitary necrosis (Sheehan's syndrome) infrequently causes hypopituitarism. Hyponatremia is a rare initial manifestation of postpartum pituitary insufficiency, particularly when it occurs within a few days of parturition. We report a case of early Sheehan's syndrome initially seen as severe inappropriate secretion of antidiuretic hormone.

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Case report

A 27-year-old woman complained of headache and weakness. Seven days earlier she had been vaginally delivered of a healthy male infant. Immediately post partum she had an estimated 2 L uterine hemorrhage with shock. She was resuscitated with blood and colloids; hemorrhage was controlled with uterine massage, oxytocin, and ergotamine. One week after delivery she suddenly had paresthesias, slurred speech, headache, weakness, and somnolence. She also noted new diffi-