

Laparoscopic Extracorporeal Oophorectomy and Ovarian Cystectomy in Second Trimester Pregnant Obese Patients

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ABSTRACT

Objectives: To determine whether a modified technique for laparoscopic extracorporeal oophorectomy is less complicated and safer than traditional laparoscopic oophorectomy.

Methods: Four obese patients in their second trimester underwent open laparoscopy for treatment of large ovarian cysts. A Cook Ob/Gyn special cyst aspirator with a 14-gauge aspirating needle was inserted into the abdomen to drain the ovary through a separate 10-mm port; the site of insertion depends on the location of the ovary. After the cyst was decompressed, the 10-mm incision was enlarged to 3 cm, and either extracorporeal oophorectomy or cystectomy was performed.

Results: No complications occurred. Average blood loss was less than 15 cc; average carbon dioxide insufflation time was less than 20 minutes. Average operating time was 40 minutes, which was significantly less than traditional laparoscopic oophorectomy. The patients were discharged in less than 23 hours. Patient A had a 500-cc dermoid cyst, and subsequently had a normal vaginal delivery at term. Patient B had a 1600-cc cyst removed. She had a cesarian delivery due to cephalopelvic disproportion. Pathological analysis of the specimen identified the mass as a dermoid cyst and serous cystadenoma. Patient C had a 3200-cc ovarian cyst. Currently, she is in her 24th week of gestation. Patient D had a 700-cc simple ovarian cyst removed at her 16th week of gestation.

Conclusions: Laparoscopic extracorporeal oophorectomy requires significantly less CO₂ insufflation time and a shorter operation time, hence, decreasing the adverse effects on the fetus. The enlarged second trimester uterus made traditional laparoscopy more complicated. Per-

forming the procedure extracorporeally decreased the possibility of operative complications.

Key Words: Laparoscopy, Oophorectomy, Ovarian cystectomy, Pregnancy.

INTRODUCTION

It has been indicated in the literature that pregnancy, or potential pregnancy, is one of the absolute contraindications for laparoscopic procedures like appendectomy, cholecystectomy, and evaluation of adnexal masses. However, with the increasing popularity of laparoscopic surgery, many more articles have been published that attest to the safety and benefit of laparoscopic surgery in pregnancy. It is a well-known fact that obesity is a growing problem in United States population.¹⁻¹⁵ Obesity is not only a major health issue in our society but is also a challenge to laparoendoscopic surgeons during operations.

Obesity increases abdominal pressure, thus requiring higher insufflation pressure to accomplish the laparoscopic procedures. It is not easy to perform trocar entry into the abdomen in this group of patients. Frequently, we encounter CO₂ gas leaks, insufficient length of the laparoscopic trocar sleeves and instruments, and a decrease in operative field exposure due to the presence of large amounts of body fat and bowel. An enlarged second trimester uterus and a large ovarian cyst added to this scenario make for an unpleasant experience to which any skillful laparoendoscopic surgeon can probably testify.

Obstetricians often encounter large ovarian cysts or benign tumors in pregnancy. The ovarian cysts usually undergo spontaneous resolution. Some cysts that persist after the first trimester may endanger the patient or the growing fetus. The rupture of ovarian cysts can occur at any time with an increase in intraabdominal pressure from the growing uterus or when the patient is in labor. Labor dystocia may even be a consequence of a large ovarian cyst or tumor because it may prevent descent of the fetus into the birth canal. Needless to say when it

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ruptures, undoubtedly an emergency situation occurs as a result of chemical peritonitis. This warrants surgical intervention, including a traditional laparotomy or laparoscopy procedure.

We have been performing laparoscopic extracorporeal adnexal surgery, and we find that it is easier and quicker than the traditional laparoscopic approach.

We, therefore, applied the same principle of the procedure to the pregnant patient and have accumulated a total of four operative laparoscopic cases of ovarian pathologies during the second trimester of pregnancy. Three of the four patients were considered obese, and the fourth patient was overweight. All four patients underwent ultrasound, CA 19-9, CA 125 and some other tumor marker testing preoperatively.

PATIENTS AND METHODS

Patient A was a 27-year-old gravida 2, para 1, female who underwent an ultrasound at 15 weeks that showed a 7-cm complex ovarian mass consistent with a dermoid cyst. Tumor markers were within normal limits. She was asymptomatic, and subsequent sonograms did not show resolution of the cyst. Her weight was approximately 200 pounds when she underwent surgery in her 17th week of pregnancy.

Patient B was a 21-year-old gravida 3, para 1011 female. She had had a previous laparoscopic extracorporeal ovarian cystectomy for a 1500-cc right simple ovarian cyst. Her ultrasound at 12 weeks showed a 10-cm septated right ovarian cyst. A follow-up sonogram showed that the cystic structure had increased in size. Although the patient was asymptomatic at the 15th week of gestation, a laparoscopic extracorporeal ovarian cystectomy was performed. At the time of surgery, she weighed 240 pounds. The CA 125 and CA 19-9 were normal. A 1600-cc cyst was removed.

Patient C was a 30-year-old, 350-pound gravida 4, para 2012 massively obese woman. She underwent obstetrical ultrasounds at the 12th and 15th weeks of gestation. We were not able to detect the large ovarian cyst. At the 19th week, a repeat sonogram demonstrated a 25-cm right ovarian cyst. The patient did not have any symptoms. At 22 weeks gestation, a 3200-cc ovarian cyst was removed. Patient C also had normal tumor markers.

Patient D was a 36-year-old woman weighing 185 pounds

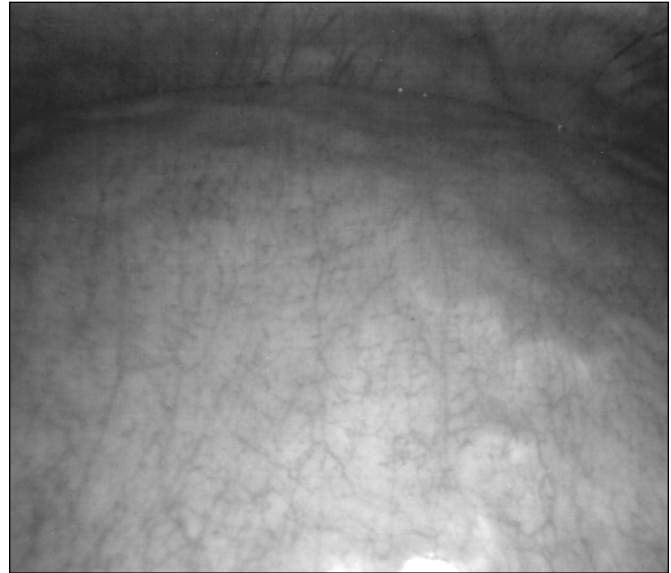


Figure 1. The enlarged 22-week gravid uterus.

with a history of endometriosis and polycystic ovarian disease. She was the only one with a complaint of right lower quadrant discomfort. At 6 weeks of pregnancy, a large 8-cm right ovarian cyst was detected by sonogram. The patient was placed on pelvic rest and sonograms were repeated at the 11th and 14th weeks of gestation. The size of the cyst had increased. At the 16th week of gestation, a 700-cc simple ovarian cyst was excised.

All of these surgeries were performed with the patient under general anesthesia. We used the Hasson open laparoscopic technique for placement of the umbilical port because of the enlarged gravid uterus and the large ovarian cyst (**Figures 1 and 2**). A second 5-mm port was inserted for a grasping instrument. The third port site was 10- to 11-mm, and its placement depended on the location of the enlarged ovary (**Figure 3**).

A cyst aspirator device (Cook OB/GYN, Spencer, Indiana) was inserted through the 10- to 11-mm port site. The tip should be placed on the thinnest part of the ovarian capsule. Once the suction vacuum was switched on, the aspirator sleeve created a seal between the suction aspirator tip and the ovarian capsule, which prevented spillage (**Figure 4**).

A 14-gauge long aspirating needle from the same set was introduced through the aspirator sleeve to puncture the



Figure 2. Enlarged ovarian cyst 3.2 litres. Note the liver edge and diaphragm on the left.



Figure 4. Decompressing the large ovarian cyst. Bowel on the left and liver on the right.



Figure 3. Insertion of the 10-11-mm trocar under direct visualization. Note the liver edge on the right corner.

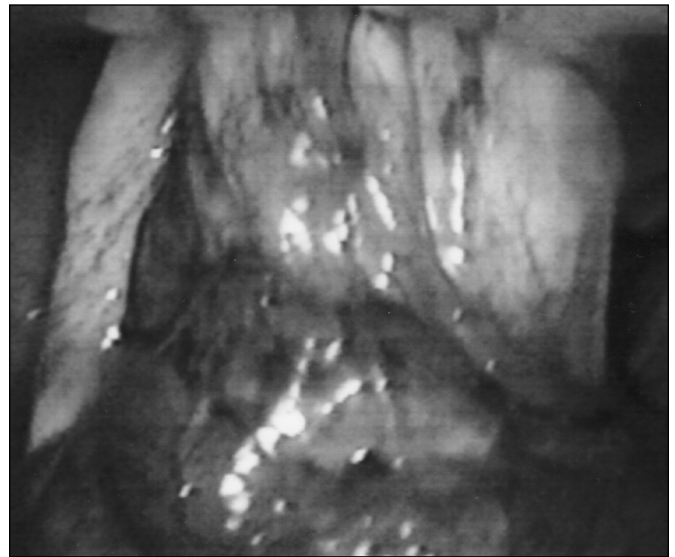


Figure 5. Retraction of the decompressed ovarian cyst out of the anterior abdominal wall through the 3-cm enlarged port site.

cyst so the aspiration could begin. As the cyst was grossly decompressed, gentle traction of the suction aspirator pulled the ovary to the anterior abdominal wall incision. The 10- to 11-mm port site was then enlarged to about 3

to 4 cm (**Figure 5**), and the ovary was extracted out of the abdomen (**Figure 6**). A partial extracorporeal oophorectomy or cystectomy was performed easily in a reasonable amount of time (**Figure 7**).



Figure 6. Extracorporeal cystectomy.



Figure 7. Extracorporeal cystectomy, then the ovary was put back into the abdomen and the incision closed.

RESULTS

No operative complications occurred, and the average blood loss was less than 15 cc. Average CO₂ insufflation time was about 20 minutes with an average anesthesia time of about 40 minutes, which is significantly less time than traditional intracorporeal laparoscopic adnexal surgery. All of the patients were discharged less than 23 hours following surgery, and no tocolysis was used.

Patients A and C had full-term normal vaginal deliveries. Patient D had an uneventful low forcep delivery at the 40th week. Patient B required a cesarean delivery due to cephalopelvic disproportion. The specimen for patient A was identified as a dermoid cyst. Serous cystadenomas were found in patients B and C. Patient D was found to have a large simple ovarian cyst. Patient C had a postpartum laparoscopic tubal ligation, and we observed no adhesion formation in the adnexa.

CONCLUSION

Numerous articles have been published that attest to the safety and value of laparoscopic surgery during pregnancy.¹⁻¹⁵

Laparoscopic ovarian cystectomy and oophorectomy are usually performed intracorporeally.¹⁻¹¹ This method, in

general, requires a slightly longer operative time and lengthier CO₂ insufflation, in addition to the longer general anesthesia.¹⁻³

Obese patients have significantly higher intraabdominal pressure and, therefore, require higher CO₂ abdominal insufflation pressure. The higher pressure may increase the absorption of CO₂ into the circulation. It is more difficult to perform laparoscopic surgery in this group of patients, and it requires a longer operating time. All factors, such as the enlarged second trimester uterus, large ovarian mass, and the larger amount of abdominal fat present in obese patients, can make the traditional operative laparoscopy more complicated and increase the central nervous system (CNS) depressant effect of the fetus.

In our experience, laparoscopic extracorporeal oophorectomy or laparoscopic extracorporeal ovarian cystectomy not only requires less CO₂ insufflation but can also be performed with a shorter anesthesia and operative time. This decreases the possibility of adverse CNS depressant effects on the fetus.

To minimize the iatrogenic rupture of the uterus, we selected the Hasson open laparoscopic technique for abdominal entry and used as few port sites as possible. By also avoiding the routine endoscopic instrumental

maneuvers in the abdomen, such as dissecting, cutting, and electrocoagulation, we avoided unnecessary operative injury. We were prepared to perform laparotomy at any time and had notified the blood bank in the event a large amount of whole blood for transfusion was needed.

Incidental intraabdominal tumor spillage was also a concern. However, by using the special cyst aspirator, we avoided the spillage because a vacuum was created on the ovarian capsule. If disruption of the vacuum had occurred, a grasping forcep would have been used to close the ovarian puncture site and then the capsule would have been readjusted and resealed. This, however, did not happen in any of our cases. Once the size of the ovary was sufficiently decompressed, we were able to bring the ovary out of the abdomen and continue suctioning the ovarian cystic fluid. This also decreased the possibility of spillage. Wound contamination was avoided by using a lot of wet gauze to protect the incision. Now new products are available that can be placed around the incision to prevent contamination. In addition, we used a large amount (at least 3 liters) of warm irrigating saline solution to rinse the entire abdominal cavity.

Frozen sections were also made after we removed the ovarian tumor. We also counseled the patients preoperatively regarding the possible necessity of performing staging laparotomy. Although the risk of malignant ovarian tumor is very low, informing the patient is a necessary precaution.

This study consists of only four cases. The basic principle indicates, however, that the combination of laparoscopic extracorporeal oophorectomy and laparoscopic extracorporeal ovarian cystectomy can be performed easily regardless of the size of the patient, and this combination appears to be safer when performed during the second trimester. This combination may be the procedure of choice for the obese female patient, even in more advanced pregnancies.^{9,15}

References:

1. Vilos GA. Laparoscopic salpingo-oophorectomy during pregnancy. *J Am Assoc Gynecol Laparosc.* 1995;2:463-445.
2. Guerrieri JP, Thomas RL. Open laparoscopy for an adnexal mass in pregnancy. A case report. *J Reprod Med.* 1994;39:129-130.
3. Nezhat F, Nezhat C, Silfen SL, Fehnel SH. Laparoscopic ovarian cystectomy during pregnancy. *J Laparoendosc Surg.* 1991;1:161-164.
4. Yuen PM, Chang AM. Laparoscopic management of adnexal mass during pregnancy. *Acta Obstet Gynecol Scand.* 1997;76:173-176.
5. Neiswender LL, Toub DB. Laparoscopic excision of pelvic masses during pregnancy. *J Am Assoc Gynecol Laparosc.* 1997;4:269-272.
6. Andreoli M, Servakov M, Meyers P, Mann WJ Jr. Laparoscopic surgery during pregnancy. *J Am Assoc Gynecol Laparosc.* 1999;6:229-233.
7. Sturlese E, Retto G, Pulia A, Tripodi A, La Gamba D. Laparoscopic salpingo-oophorectomy during pregnancy. A case report. *Clin Exp Obstet Gynecol.* 2000;27:61-62.
8. Levy T, Dicker D, Shalev J, et al. Laparoscopic unwinding of hyperstimulated ischaemic ovaries during the second trimester of pregnancy. *Hum Reprod.* 1995;10:1478-1480.
9. Martin IG, Dexter SP, McMaho MJ. Laparoscopic cholecystectomy in pregnancy. A safe option during the second trimester? *Surg Endosc.* May 1996;10:508-510.
10. Luxman D, Cohen JR, Almog B, et al. Laparoscopic procedures during pregnancy for gynecologic and nongynecologic indications. *J Am Assoc Gynecol Laparosc.* 1999;6(Suppl):S33, 114.
11. Hess WL, Peaceman A, O'Brien WF, et al. Adnexal mass occurring with intrauterine pregnancy: report of fifty-four patients requiring laparotomy for definitive management. *Am J Obstet Gynecol.* 1988;158:1029-1034.
12. Parker WH, Berek JS. Management of the adnexal mass of operative laparoscopy. *Clin Obstet Gynecol.* 1993;36:423-422.
13. Elerding SC. Laparoscopic cholecystectomy in pregnancy. *Am J Surg.* 1993;165:625-627.
14. Lanzafame RJ. Laparoscopic cholecystectomy during pregnancy. *Surgery.* 1995;118:627-633.
15. Pucci RO, Seed RW. Case report of laparoscopic cholecystectomy in the third trimester of pregnancy. *Am J Obstet Gynecol.* 1991;165:401-402.

Disclosure: We, Maurice K. Chung RPh, MD, FACOG, ACEG and Rosemary P. Chung, BSN, PA-C, have no financial interest in any commercial device, equipment, instrument, or drug used as a subject in the article.