

***Corresponding author**

*Mario Roberto Pinto Romero,
Medical Specialist in Gynecology
and Obstetrics, Master's Degree in
Gynecological Laparoscopy, Univer-
sity of the Mexican Army and Air
Force, Expert in Endoscopic Gyneco-
logical Oncology.

**14-year experience in the Management of Benign
Adnexal Masses by Laparoscopy**

Mario Roberto Pinto Romero^{1*}, Mauricio Adolfo Caballero², Javier Or-
lando Reyes³, Napoleón Galo Jordán⁴ and Tania Henríquez Zuniga⁵

¹Medical Specialist in Gynecology and Obstetrics, Master's Degree in Gyneco-
logical Laparoscopy, University of the Mexican Army and Air Force, Expert in
Endoscopic Gynecological Oncology

²Medical Specialist in Gynecology and Obstetrics Faculty of Medical Sciences of
the UNAH, Master in Reproductive Biology

³Medical Specialist in Gynecology and Obstetrics Faculty of Medical Sciences of
the UNAH

⁴Physician Specialist in Gynecology and Obstetrics University of Puebla Mexico

⁵Physician Specialist in Gynecology and Obstetrics Faculty of Medical Sciences
of the UNA

Summary

We treated 1158 patients, in different hospitals in the northern area of Honduras, of May 2006 to May 2020 with different gynecological pathologies, which 553 were due to simple ovarian cysts, 122 were due to torsion and these 3 giant ovarian cysts by laparoscopy; 431 for laparoscopic ovarian diathermy for the surgical management of polycystic ovarian syndrome resistant to conservative treatment; 497 between endometriosis and endometriomas (348 and 149 respectively) between these two pathologies were performed 391 adherenciolisis; 58 cases of ectopic pregnancies of which 11 were salpingostomies and 47 were salpingectomies; 29 teratomas of which 13 completely removed the intact capsule by hydrodissection and 16 underwent oophorectomy; and other pathologies found that were 21, including 8 appendectomies, 3 extractions of the foreign body (IUD), 2 pelvic Tuberculosis diagnosed by pathology and peritoneal fluid, 2 torsion of the left tube and Hydrosalpinx 4, and 2 torsion of the right ovarian cyst in pregnancy of 14 weeks of pregnancy. Conclusion: Laparoscopic gynecological surgery is a surgical technique that has great benefits for patients who undergo this procedure, for this reason they have to perform institutional protocols to reduce the risk of complications.

Keywords: Adnexal Masses, Laparoscopic Gynecology

Introduction

Adnexal masses are commonly found in gynecological practice and it is a dilemma to diagnose and treat each one of them; some require immediate surgical treatment (1). With the help of gynecological laparoscopic surgery, adequate and timely management of adnexal pathology in gynecology has been achieved.

The diagnosis of adnexal masses includes those of gynecological and non-gynecological origin (1). Among those of gynecological origin, they can be: benign eg. Functional cyst (follicular cyst), endometrioma, tubal abscess, ectopic pregnancy, mature teratoma, serous cystadenoma, mucinous cystadenoma, hydrosalpinx, etc. And evil ex. Germ cell tumor, stromal tumor, epithelial carcinoma.

Among those of non-gynecological origin: benign eg. Diverticular abscess,

appendicular abscess or mucocele, urethral diverticulosis, pelvic kidney, bladder diverticulum, etc. And evil ex. Gastrointestinal cancer, retroperitoneal sarcoma among others.

The most widely used diagnostic method is ultrasound, and the information obtained should include size, consistency of the mass (cystic, solid, or mixed), whether it is unilateral or bilateral, the presence of abscesses or septa, mural nodules, papillary excrescences, and free fluid. in the pelvic cavity, the presence of vascularity in an adnexal mass through Doppler is predictive of malignancy (2,3)

In the physical examination, a pelvic examination is very important, including a rectal examination, sometimes under anesthesia, when there is a body mass index above 30%, which limits the ability to identify an adnexal mass (4).

Another diagnostic method used is computerized axial tomography, where omental metastases, peritoneal implants, liver metastases, enlarged peri-aortic lymph nodes can be detected (5-8).

The most extensively studied serological marker for being associated with malignancy in the presence of a pelvic mass in CA 125; it is elevated in 80% of cases of epithelial ovarian cancer, but only 50% of stage I patients are diagnosed on time (9).

HE4 (Human Epididymal Protein 4) is a new marker, complementary to CA 125 in the diagnosis of ovarian tumors. HE4 is a glycoprotein that is overexpressed in ovarian cancer, but not in benign conditions. Combining both tests (CA 125 + HE4) increases the sensitivity for determining the risk of malignancy in patients with ovarian cysts and pelvic masses. There are points to take into account with the ROMA Risk of Ovarian Malignancy Algorithm.

The following parameters are used: CA 125 and HE4 values (U/ml), age of the woman, menstrual status (Pre/Postmenopausal)

Pre-menopausal: ROMA greater than or equal to 7.4% high risk of ovarian cancer.

Postmenopausal women: ROMA greater than or equal to 25.3% high risk of ovarian cancer (10)

The objective of this study was to determine the efficacy of laparoscopic surgery in the management of different gynecological adnexal masses and to identify their complications over the course of 14 years, and to establish biosafety protocols for patients with coronavirus and health personnel.

Materials and Methods

This is a descriptive, cross-sectional and multicenter study that was carried out over a period of 14 years (from May 2006 to May 2020). A total of 1,158 gynecological laparoscopic surgeries were performed in different hospitals in the north-western region of Honduras (Northern Regional Military Hospital, San Pedrano Cemesa Medical Center, Valle Hospital, Monte de Sion Medical Center, San Ignacio Clinic, Plaza Médica Clinic, Polyclinic Honduran, La Lima Medical Center Hospital, Leonardo Martínez Valenzuela Hospital). All patients with a clinical or imaging diagnosis of: Teratoma or dermoid cyst, Endometrioma, Ectopic Pregnancy, Endometriosis, simple ovarian cysts, Hydrosalpinx were included in the study, using these as inclusion criteria. And they signed an informed consent sheet as part of the care protocol, and a data collection sheet, which includes imaging diagnoses, hospital stay, postoperative evolution, observed complications. For the laparoscopic technique, it includes general anesthesia, in some cases the patient in the lithotomy position, after asepsis and antisepsis, placement of a bladder catheter and placement of sterile fields, where CO2 between 12 and 15 mm of mercury is insufflated with a Veress needle or by means of a technique open, three entry ports were used, one at the umbilical level of 5 or 10 mm, another at the level of the left flank of 5 mm and another at the level of the left iliac fossa 2 cm from the left iliac crest of 5 or 12 mm. In the last 4 months of the study, protocols were established for the biosafety of patients and health personnel, and among them are: - request a diagnostic test for Covid 19 (Rapid Test or PCR or Antibodies) to all patients who were intervened;- use a Level 3 biosafety suit trying to minimize the risks to medical and nursing staff;- use a chlorine reservoir trap by placing a hose in one of the accessory trocars so that the CO2 inside the abdominal cavity is extracted through the trap.

Results

1158 laparoscopic gynecological surgeries were registered, in the 14 years of the study, of which 553, which represents 47.76%, were due to simple ovarian cysts, of which 122 were due to torsion and of these 3 giant ovarian cysts by laparoscopy and 431 by laparoscopic ovarian diathermy for the surgical management of polycystic ovary syndrome resistant to conservative treatment; 497 representing 42.92% between endometriosis and endometriomas (348 and 149 respectively) between these two pathologies 391 adhesiolysis were performed; 58 cases of ectopic pregnancies representing 5.01% of which 11 were salpingostomies and 47 were salpingectomies; 29 teratomas, these represent 2.50% of which 13 completely removed the intact capsule and 16 underwent

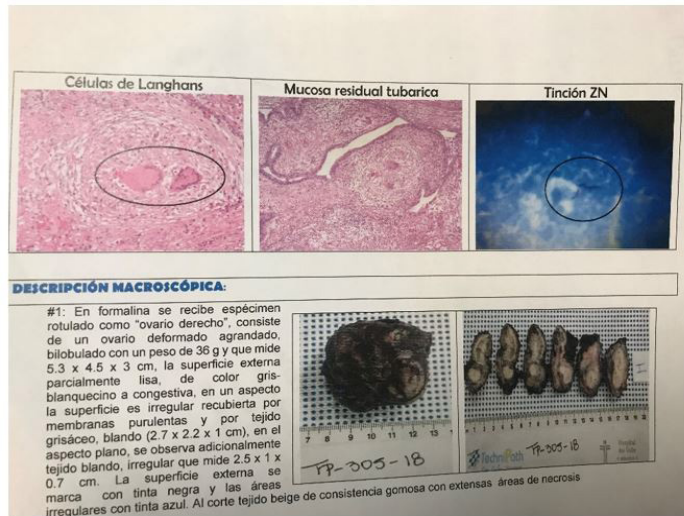
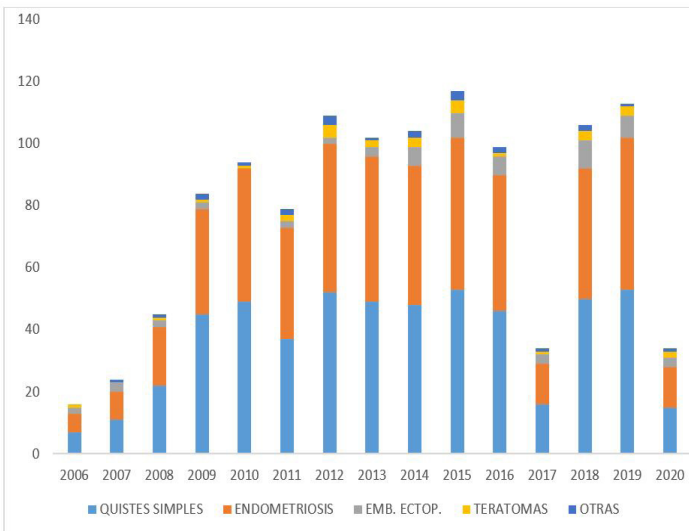


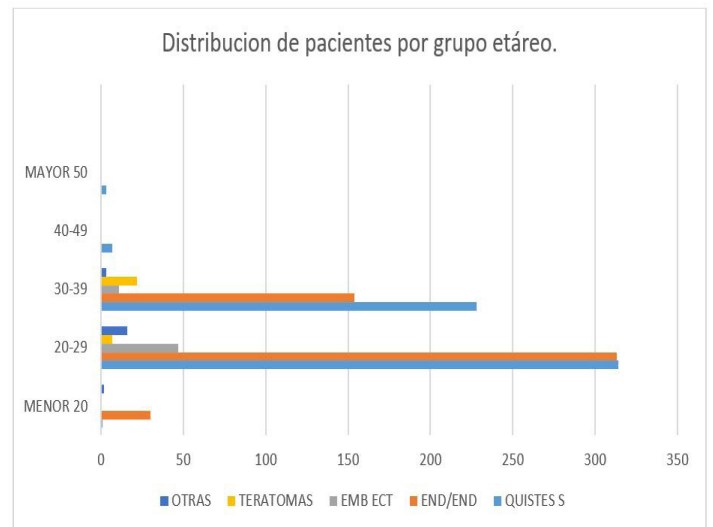
Figure 1: Report sample of pathology of pelvic tuberculosis, found by laparoscopy



Figure 2: Left fallopian tube torsion, with necrosis of the same, left salpingectomy is performed.



Graph 1: Incidence of different gynecological pathologies treated by laparoscopy in 14 years



Graph 2: Distribution of patients by age group

Table 1: Data on the frequency of the different pathologies after 14 years of study, treated by laparoscopy.

	QUISTES SIMPLES	ENDOMETRIOSIS ENDOMETRIOMAS	EMB. ECTP.	TERATOMAS	OTRAS
2006	7	6	2	1	0
2007	11	9	3	0	1
2008	22	19	2	1	1
2009	45	34	2	1	2
2010	49	43	0	1	1
2011	37	36	2	2	2
2012	52	48	2	4	3
2013	49	47	3	2	1
2014	48	45	6	3	2
2015	53	49	8	4	3
2016	46	44	6	1	2
2017	16	13	3	1	1
2018	50	42	9	3	2
2019	53	49	7	3	1
2020	15	13	3	2	1

oophorectomy; and other pathologies found that were 21 and represent 1.81% which include appendectomy 8, foreign body extraction (IUD) 3, pelvic tuberculosis 2 diagnosed by pathology and peritoneal fluid. Figure (1), tubal torsion 2 and Hydrosalpinx 4. Figure (2), and right ovarian cyst torsion in a 14-week pregnancy 2. (Graph and Table1). The age between 20 and 39 years was where 96.2% of laparoscopic surgeries were performed (Graph 2).

Among the complications that arose was an inadvertent thermal injury to the intestine due to multiple pelvic adhesions, for which an exploratory laparotomy with colostomy was performed 24 hours later, as well as 1 noticed bladder injury which was repaired at that time, 1 abdominal wall abscess in one of the trocars managed with antibiotic therapy and drainage, 1 incarcerated hernia in one of the 12-mm trocars of a diabetic patient which was repaired on the fourth day of surgery; 9 surgeries were converted (laparotomy was performed at the same surgical time) due to multiple adhesions and difficult to approach, these complications represent 1.12% of all surgeries performed by laparoscopy.

Conclusions

According to the care guidelines for patients with adnexal masses (11,12) with imaging evaluations (ultrasound or control tomography) and clinical evaluations, the benefit of the gynecological laparoscopic procedure in the postoperative evolution of the patient was verified, less pain, faster recovery, faster return to productive life (13,14). In the case of pregnant patients with adnexal masses, there is not enough evidence where we have to wait for fetal maturity to perform a laparoscopy, if there are no symptoms of torsion of a cyst it can be managed conservatively (15).

We cannot fail to remember all the benefits that this type of surgery has for patients: less pain, less hospital stay, quick recovery; but it also has to do with the experience of the surgeon and the work team (16-18).

The protocols established for the safety of health personnel are essential for carrying out laparoscopic surgical procedures, although it is true at the beginning we only handle emergencies without coronavirus, we have to take into account those patients who have Covid 19 who are asymptomatic but who have an existing gynecological pathology that decreases their quality of life, for this reason this is one of the alternative surgical methods to treat this type of condition.

95% of surgical gynecological pathologies can be approached laparoscopically and this surgical technique is increasing, so we recommend gynecological laparoscopy programs for gynecology residents.

References

1. Koonings P, Campbell K, Mishell D, Daniel R, Grimes DA. Relative Frequency of primary ovarian neoplasms: a 10 years review, *Obstet Gynecol* 1989;74(6):921-6.
2. Bristow RE, Zahurak ML, Diaz-Montes TP, Giuntoli RL, Armstrong DK. Impact of surgeon and hospital ovarian cancer surgical case volume on in-hospital mortality and related short-term outcomes. *Gynecol Oncol* 2009;115:334-8
3. Mohan L, Rao A, Ullal S, Krishna G, Accuracy of pelvic mass score in preoperative determination of malignancy in adnexal masses, *Journal of clinical and diagnostic research*, 2016, 10(11), QC01-QC03 | added to CENTRAL: 28 February 2017 | 2017 Issue 2
4. Goff BA, Matthews BJ, Wynn M, Muntz HG, Lishner DM, Baldwin LM. Ovarian cancer: patterns of surgical care across the United States. *Gynecol Oncol* 2006;103:383-90
5. Bristow RE, Palis BE, Chi DS, Cliby WA. The National Cancer Database report on advanced-stage epithelial ovarian cancer: impact of hospital surgical case volume on overall survival and surgical treatment paradigm. *Gynecol Oncol* 2010;118:262-7.
6. American College of Obstetricians and Gynecologists. The role of the generalist obstetrician-gynecologist in the early detection of ovarian cancer. ACOG Committee Opinion No. 280. *Obstet Oncol* 2002;100:1413-6.
7. Goff BA, Mandel LS, Melancon CH, Muntz HG. Frequency of symptoms of ovarian cancer in women presenting to primary care clinics. *JAMA* 2004;291:2705-12
8. Smith LH, Morris CR, Yasmeen S, Parikh-Patel A, Cress RD, Romano PS. Ovarian cancer: can we make the clinical diagnosis earlier? *Cancer* 2005;104:1398-407.
9. Goff BA, Mandel L, Drescher CW, Urban N, Gough S, Schurman KM, et al. Development of an ovarian cancer symptom index. *Cancer* 2007;109:221-7.
10. Moore Rg, McMeekin DS, Brown AK, DiSilvestro P, Miller MC, Allard WJ, Gajewski W, Kurman R, Bast RC Jr, Skates SJ. A novel multiple marker Bioassay utilizing HE4 and CA 125 for the prediction of ovarian cancer in patients with a pelvic mass. *Gynecol Oncol* 2009;112(1):40-6.
11. Im S, Gordon A, Buttin B, Leath CA III, Gostout BS, Shah C, et al. Validation of referral guidelines for women with pelvic masses. *Obstet Gynecol* 2005;105:34-41.
12. Dearing AC, Aletti G, McGree M, Weaver AL, Sommerfield M, Cliby WA. How relevant are ACOG and SGO guidelines for referral of an adnexal mass. *Obstet Gynecol* 2007;110:841-8.
13. Fanfani F, Fagotti A, Ercoli A, Bifulco G, Longo R, Mancuso S, Scambia G. A prospective randomized study of laparoscopy and minilaparotomy in the management of benign adnexal masses, *Human reproduction (oxford, england)*, 2004, 19(10), 2367-2371 | added to CENTRAL: 31 July 2005 | 2005 Issue 3
14. Karasu Y, Akselim B, Kavak Comert D, Ergun Y, Ulker K, Comparison of single-incision and conventional laparoscopic surgery for benign adnexal masses, *Minimally invasive therapy and allied technologies*, 2017, 1-6 | added to CENTRAL: 31 May 2018 | 2018 Issue 5
15. Tristao R, Figueiredo G, Angimahtz T, Adnexal mass and pregnancy, *International journal of gynaecology and obstetrics*, 2018, 143, 545- | added to CENTRAL: 30 November 2018 | 2018 Issue 11
16. Karasu Y, Akselim B, Kavak Comert D, Ergun Y, Ulker K, Comparison of single-incision and conventional laparoscopic surgery for benign adnexal masses, *Minimally invasive therapy and allied technologies*, 2017, 1-6 | added to CENTRAL: 31 May 2018 | 2018 Issue 5
17. Darwish AM, Amin AF, Abdelaleem MA, Youssef MA, Laparoscopic management of benign adnexal masses: experience in a developing

country, Gynaecological endoscopy, 2001, 10(3), 159-165 | added to CENTRAL: 31 October 2003 | 2003 Issue 4.

18. Deckardt R, Saks M, Graeff H, Comparison of minimally invasive surgery and laparotomy in the treatment of adnexal masses, Journal of the American Association of Gynecologic Laparoscopists, 1994, 1(4 Pt 1), 333-338 | added to CENTRAL: 31 January 1998 | 1998 Issue 1