

Laparoscopic surgery for treating adnexal masses during the first trimester of pregnancy

Lucas Minig¹, Lucas Otaño², Pilar Cruz², María Guadalupe Patrono², Cecilia Botazzi², Ignacio Zapardiel³

¹Department of Gynecology, Valencian Institute of Oncology (IVO), Valencia, Spain,

²Department of Obstetrics and Gynecology, Hospital Italiano de Buenos Aires, Buenos Aires, Argentina,

³Department of Obstetrics and Gynecology, La Paz University Hospital, Madrid, Spain

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The objective: to evaluate the feasibility and safety of laparoscopic surgery for treating adnexal masses during the first trimester of pregnancy.

Patients and methods. An observational study of a prospective collection of data of all pregnant women who underwent laparoscopic surgery for adnexal masses during the first trimester of pregnancy between January 1999 and November 2012 at the Obstetrics and Gynecology Department of the Italian Hospital of Buenos Aires, Buenos Aires, Argentina was performed.

Results. A total of 13 women were included. The median (range) gestational age at the moment of surgical procedure was 7 weeks (range: 5–12 weeks). The main indication of surgery was cyst torsion in four cases (30.7%) and rupture of ovarian cysts in four cases (30.7%). Other indications included persistent ovarian cyst in three patients (23%) and heterotopic pregnancy in two cases (15.3%). Neither surgical complications nor spontaneous abortions occurred in any of the cases and the post-operative period was uneventful in all the cases. No cases of intrauterine growth retardation, preterm delivery, congenital defects, or neonatal complications were registered.

Conclusion. The treatment of complicated adnexal masses by laparoscopic surgery during the first trimester of pregnancy appears to be a safe procedure both for the mother and for the foetus. Additional research on a larger number of cases is still needed to support these conclusions.

Key words: adnexal masses, first trimester, laparoscopy, ovarian cyst, pregnancy.

The incidence of adnexal masses during pregnancy can range between 1:81 and 1:8,000 [1]. Despite the fact that a great majority of the adnexal masses are diagnosed at the time of a first trimester ultrasound, it is estimated that over 1–2% of them will become symptomatic during the first trimester of pregnancy and they will develop complications that will require surgical treatment [2]. The most common causes of ovarian masses during pregnancy include dermoid cyst, functional cysts, serous/mucinous cystadenoma and endometrioma [3]. Even though surgery has been traditionally performed by laparotomy, recently there has been a great debate about the role of laparoscopy in the management of adnexal masses in pregnancy [3]. Despite the well-known advantages of minimally invasive surgery, caution with laparoscopic surgery has been suggested for both the mother and the foetus due to complications such as foetal loss, malformation and preterm birth [4]. These negative effects are attributed to the effects of a pneumoperitoneum and the potential foetal acidosis; possible injury to the gravid uterus by a Veress needle, trocar, or surgical instrument; and the possible injection of carbon dioxide (CO₂) into the uterine cavity [5].

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build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms. Laparoscopy for adnexal mass in pregnancy in the literature confirming these hypotheses.

The objective: of this study was to evaluate the feasibility and safety of laparoscopic surgery for treating adnexal masses during the first trimester of pregnancy.

MATERIALS AND METHODS

This is an observational study of a prospective collection of data of all pregnant women who underwent laparoscopic surgery for adnexal masses during the first trimester of pregnancy between January 1999 and November 2012 at the Obstetrics and Gynecology Department of the Italian Hospital of Buenos Aires, Buenos Aires, Argentina. The study was approved by the Institutional Review Board of the hospital. All the patients signed a written informed consent form. The maternal age, gestational age at surgery, type of surgical procedure, length of surgery, surgical complications, pathology report, gestational age at birth and birth weight were extracted from the records.

Surgery was indicated under emergency condition in case of uncontrollable pain and haemodynamic instability. Patients were also included in cases of persistent and painful adnexal mass at 12 weeks of gestation. All the patients underwent general anaesthesia with curarisation and endotracheal intubation. An open 10-mm umbilical laparoscopy technique with Hasson's trocar was performed with a maximum of three additional ports that were placed under direct vision. Abdominal insufflation with CO₂ between 10 mm and 12 mm of mercury was used. Intraoperative capnography was used during the entire procedure [3] and the patient was placed slowly and carefully in Trendelenburg position until the adnexa was visible. Free fluid/blood was initially aspirated and surgery was performed with monopolar and bipolar energy as in the non-pregnant patients. Finally, all the specimens were removed by using a laparoscopic endo-bag. Foetal ultrasound was performed before the procedure and before hospital discharge. Ketoprofen (initially intravenously and subsequently as a suppository) was used as an analgesic during the post-operative period. A volume of 600 mg of vaginal micronized progesterone was administered daily until 12 weeks of gestation. No prophylactic antibiotics and venous thromboembolism prophylaxis were administered [3]. Women and newborns were followed up for 90 days after the delivery. Perioperative data were collected and a descriptive statistical analysis was done with the software SPSS 15.0 (SPSS Inc., Madrid, Community of Madrid, Spain). For the review of the literature, a MEDLINE search of all English language articles published between 1990 and 2014 containing the search terms 'pregnancy', 'first trimester', 'laparoscopy', 'adnexal mass' was performed.

Table 1

Patients' characteristics and surgical and neonatal outcomes of the laparoscopic surgery for adnexal mass performed during the first trimester of pregnancy

Case	Maternal age, (year)	GA at surgery, week	Indication	Size of adnexal mass, mm	Surgical treatment	Duration of surgery, min	Pathology	GA at delivery, week	New bor weight, g
1	29	5	Emergency	55	Cystectomy	40	RHCLC	39	3240
2	41	5	Emergency	40	Cystectomy	50	RHCLC	38	3350
3	38	7	Emergency	35	Salpingectomy	35	Heterotopic pregnancy	37	3300
4	36	7	Emergency	60	Cystectomy	40	RHCLC	39	3240
5	30	7	Emergency ^a	65	Detorsion + Cystectomy	60	Endometriosis	38	3660
6	39	7	Emergency	50	Cystectomy	70	Serous cistoadenoma	39	3350
7	25	7	Emergency ^a	60	Detorsion + Cystectomy	25	Paratubal cyst	39	3310
8	36	8	Emergency	40	Salpingectomy	60	Heterotopic pregnancy	40	3845
9	40	11	Emergency ^a	70	Oophorectomy	60	HCLC	39	3535
10	28	12	Emergency ^a	65	Oophorectomy	50	HCLC	40	3280
11	29	12	Persistent	65	Cystectomy	40	Teratoma	40	3420
12	35	12	Persistent	50	Cystectomy	50	HCLC	40	4500
13	31	12	Persistent	75	Cystectomy	40	HCLC	41	3310

^aAdnexal torsion, GA: Gestational age, RHCLC: Ruptured haemorrhagic corpus luteum cyst, HCLC: Haemorrhagic corpus luteum cyst.

RESULTS AND DISCUSSION

A total of 13 pregnant patients underwent laparoscopic surgery for complicated adnexal mass before 12 weeks of gestation (Table 1). The median (range) gestational age at the moment of surgical procedure was 7 weeks (range: 5-12 weeks). The main indication of surgery was cyst torsion in four cases (30.7%) and rupture of ovarian cysts in four cases (30.7%). Other indications included persistent ovarian cyst in three patients (23%) and heterotopic pregnancy in two cases (15.3%). The median (range) surgical time was 50 min.

The details of the surgical procedures performed are depicted in Table 1. Cases 9 and 10 required oophorectomy due to haemorrhagic corpus luteum cyst by uncontrollable ovarian bleeding at the time of cystectomy. The median (range) hospitalization time was 27 h (range: 15–36 h). No significant problems were registered for patients under post-surgery prenatal care. All the mothers delivered a full-term, healthy newborns by vaginal delivery in eight cases and by caesarean section in the remaining five cases. No cases of intrauterine growth retardation, congenital defects, or significant neonatal complications were registered at 90 days after birth.

The present study shows that laparoscopic surgery for complicated adnexal masses performed during the first trimester of pregnancy was safe and feasible with no apparent adverse effect on the mother, and the pregnancy or perinatal outcomes were also normal.

Surgical procedures in pregnant women have devoted special attention as they are assumed to be potentially risky for the mother and the foetus. Thus, concerns regarding laparoscopy associated with foetal acidosis because of maternal conversion of CO₂ to carbonic acid or possible injury to the gravid uterus by surgical instrument such as a Veress needle were initially described [5]. However, studies have shown that even though there is maternal absorption of CO₂ with diffusion across the placenta, it is rapidly removed by the hyperdynamic maternal circulation status. To date, there is no evidence to support any negative effect of CO₂ pneumoperitoneum on neither the foetus nor the mother [6].

Several epidemiological studies [7, 8], compared the results of foetal-neonatal and maternal outcomes in women who underwent

laparotomy versus laparoscopy during pregnancy. These studies have found no significant differences in post-operative complications or pregnancy outcomes between both routes of surgery.

In the absence of any acute complications of pregnancy, the second trimester is recommended as the safest time to perform the surgery [9]. During this period, the spontaneous abortion rate is lower than that in the first trimester, the preterm delivery incidence is lower than that during the third trimester, the size of the uterus still allows the manipulation of the adnexa, the theoretical risk of teratogenesis is very low and functional ovarian cysts disappear spontaneously [9]. However, some patients with complicated adnexal masses such as adnexal torsion or ovarian cyst rupture do require emergency surgery during the first trimester of pregnancy. To date, there are 12 case series reporting on a total of 144 pregnant women with adnexal masses treated by laparoscopy during the first trimester of pregnancy [Table 2]. In accordance with our case series, the reported surgical and post-surgical pregnancy complications rates are very low [10–21]. Soriano et al. reported the results of 93 surgical interventions in pregnant women with suspected adnexal masses; 39 of them were performed by laparoscopy during the first trimester of pregnancy [14]. Within the group of laparoscopic procedures, the study reported cases of two newborns with congenital malformations, one with mild hypospadias and one with cleft lip. The incidence of those conditions was not different from that of procedures performed during the first and second trimester by laparotomy,^[14] nor different from the incidence of these conditions in the general population. A detailed summary of the main series reporting the laparoscopic management of adnexal masses during the first trimester of pregnancy is given in Table 2.

Finally, main recommendations proposed for performing laparoscopic surgery include the following [9]:

(a) Dorsal lithotomy position for surgery performed during the first trimester and a slight-left lateral position when performed during the second trimester to decrease compression on the vena cava.

(b) The instrumentation on the cervix for uterine mobilization should be avoided.

(c) Umbilical open mini-laparotomy is the preferred technique to avoid uterine damage. In cases of enlarged gravid uterus,

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Author	Year	Number of cases	Outcome
\Mashiach et al. [10]	1990	9	Two spontaneous abortion, One PROM at 25 wk
Busine and Mirullo [11]	1993	3	Uneventful
Morice et al. [12]	1997	6	Uneventful
Andreoli et al. [13]	1999	3	Uneventful
Soriano et al. [14]	1999	39	Two newborns had congenital malformations (mild hypospadias and cleft lip)
Mathevet et al. [15]	2003	17	Uneventful
Purnichescu et al. [16]	2006	8	Uneventful
Hong [17]	2006	16	Two spontaneous abortion
Lenglet et al. [18]	2006	12	Uneventful
Azuar et al. [19]	2009	11	Uneventful
Ko et al. [20]	2009	11	Uneventful
Chang et al. [21]	2011	9	One spontaneous abortion
Current study	2015	13	Uneventful
Total		157	

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a supraumbilical midline incision without using Veress needle should be performed.

(d) The intra-abdominal pressure should be less than 12 mmHg to minimize the operative time, uterus manipulation and blood loss.

The main limitation of our study included the facts that the number of cases was small. It is, however, difficult to accumulate enough data to conduct a larger study since complicated cases of adnexal masses are rare in pregnant women and patients with this condition are managed conservatively if possible. A co-ordinated online international registration may be a good strategy for collecting data prospectively to assess the risk associated with laparoscopic surgery during pregnancy. The other limita-

tion is the lack of proper information regarding the global and neuronal development of the newborns.

CONCLUSION

Although the evidence on laparoscopy is neither robust nor based on randomised controlled trials, based on our results and the review of the literature, the treatment of complicated adnexal masses by laparoscopic surgery during the first trimester of pregnancy appears to be a safe procedure for the mother as well as for the foetus. It is important to highlight, however, a possible bias of publications since complicated cases might be unpublished. Specific considerations regarding surgical technique should be taken into account by the team in order to minimize complications.

Лапароскопическая хирургия в лечении тубоовариальных образований в I триместре беременности

Lucas Minig, Lucas Otaño, Pilar Cruz, María Guadalupe Patrono, Cecilia Botazzi, Ignacio Zapardiel

Цель исследования: оценить возможность и безопасность лапароскопических операций при тубоовариальных образованиях в I триместре беременности.

Материалы и методы. Обсервационное исследование с проспективным сбором данных, в которое включали всех беременных, оперированных лапароскопическим методом по поводу тубоовариальных образований в I триместре беременности в период с января 1999 года по ноябрь 2012 года в отделении акушерства и гинекологии Итальянской больницы Буэнос-Айреса, Аргентина.

Результаты. В общей сложности в исследование были включены 13 женщин. Средний срок гестации на момент хирургического вмешательства составлял 7 нед (диапазон: 5–12 нед). Основными показаниями к операции были: перекрут кисты в четырех случаях (30,7%); разрыв кисты в четырех случаях (30,7%). Другие показания включали персистенцию кист яичников у трех пациенток (23%) и гетеротопическую беременность в двух случаях (15,3%). В ходе наблюдения не было зафиксировано ни хирургических осложнений, ни прерываний беременности, послеоперационный период протекал без осложнений во всех случаях. Не было зафиксировано ни одного случая задержки внутриутробного роста и врожденных дефектов плода, преждевременных родов или неонатальных осложнений.

Заключение. Лечение осложненных тубоовариальных образований лапароскопическим методом в I триместре беременности является безопасным как для матери, так и для плода. Однако необходимы дополнительные исследования с большим числом случаев для поддержки этих выводов.

Ключевые слова: тубоовариальные образования, I триместр, лапароскопия, киста яичников, беременность.

Лапароскопична хірургія у лікуванні тубооваріальних утворень у I триместрі вагітності

Lucas Minig, Lucas Otaño, Pilar Cruz, María Guadalupe Patrono, Cecilia Botazzi, Ignacio Zapardiel

Мета дослідження: оцінити можливість і безпеку лапароскопічних операцій у разі тубооваріальних утворень у I триместрі вагітності.

Матеріали та методи. Обсерваційне дослідження з проспективним збором даних, в яке включали всіх вагітних, прооперованих лапароскопічним методом з приводу тубооваріальних утворень у I триместрі вагітності у період з кінця січня 1999 року до листопада 2012 року у відділенні акушерства і гінекології Італійської лікарні Буенос-Айреса, Аргентина.

Результати. У дослідження були включені 13 жінок. Середній термін гестації на момент хірургічного втручання становив 7 тиж (діапазон: 5–12 тиж). Основними показаннями до операції були: перекрут кісти у чотирьох випадках (30,7%); розрив кісти у чотирьох випадках (30,7%). Інші показання включали персистенцію кіст яєчників у трьох пацієнток (23%) і гетеротопічну вагітність у двох випадках (15,3%). У ході спостереження не було зафіксовано ні хірургічних ускладнень, ні переривань вагітності, післяопераційний період перебігав без ускладнень у всіх випадках. Не було зафіксовано жодного випадку затримки внутрішньоутробного росту і вроджених дефектів плода, передчасних пологів або неонатальних ускладнень.

Заключення. Лікування ускладнених тубооваріальних утворень лапароскопічним методом у I триместрі вагітності є безпечним як для матері, так і для плода. Однак необхідні додаткові дослідження з великою кількістю випадків для підтримки цих висновків.

Ключові слова: тубооваріальні утворення, I триместр, лапароскопія, кіста яєчників, вагітність.

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НОВОСТИ МЕДИЦИНЫ

ПЕРИОД МЕЖДУ СКРИНИНГОВЫМИ ОБСЛЕДОВАНИЯМИ ШЕЙКИ МАТКИ МОЖЕТ БЫТЬ УВЕЛИЧЕН ДО 10 ЛЕТ

Женщины старше 40 лет, получившие отрицательный результат теста на вирус папилломы человека (ВПЧ), могут проходить следующий тест лишь через десять лет.

Инфицирование ВПЧ - один из факторов риска развития рака шейки матки. В настоящее время женщинам предлагают впервые пройти такой скрининг в 25-летнем возрасте, после чего его рекомендуют повторять каждые три года. После 50 лет тест на ВПЧ проводят реже - раз в пять лет. Чаще такие исследования проводить не стоит - велика вероятность обнаружения дисплазии или других состояний, которые могут исчезнуть самостоятельно.

Их лечение может сопровождаться серьезными побочными эффектами - в результате диагностика принесет больше вреда, чем пользы.

Ученые из Нидерландов проанализировали данные более чем о 43 тысячах женщин в возрасте от 29 лет до 61 года, наблюдение за которыми продолжалось в течение 14 лет. Авторы пришли к выводу, что у женщин старше 40 лет, у которых тест на ВПЧ оказался отрицательным, риск появления аномальных клеток во влагалище и шейке матки был на 72% ниже, чем у более молодых участниц исследования. Кроме того, было показано, что тест на ВПЧ при оценке риска

развития рака шейки матки, был точнее, чем ПАП-тест, также использующийся для этих целей.

Ученые считают, что для женщин после 40, входящих в группу низкого риска, в таком возрасте можно делать скрининг раз в десять лет, а не раз в пять. Однако исследователи отмечают, что женщина должна обращать внимание на свое состояние здоровья, регулярно посещать гинеколога и своевременно сообщать о замеченных изменениях врачу. Одним из симптомов, на который нужно обязательно обратить внимание, является кровотечение между менструациями, во время секса, либо после наступления менопаузы.

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