

## Laparoscopic Management of Ovarian Dermoid Cysts: The Safety and Efficacy

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### Abstract

**Objective:** The efficiency and safety of laparoscopic surgery in the management of ovarian dermoid cyst.

**Material and Methods:** Our study included forty patients with diagnosis of unilateral or bilateral dermoid cysts between August 2006 and May 2008 underwent laparoscopic removal of dermoid cysts. All cases were performed at department of obstetrics and Gynecology, women's health centre, Faculty of Medicine, Assiut University. All specimens removed in all cases were sent for pathological examination to confirm the diagnosis.

**Results:** The mean patient age was 26.4 years (range 19-36), 25 patients were nulliparous and 15 were multiparous. Thirty-six patients had unilateral cyst (90%) (RT side 69.4% and Lt side 30.6%) and 4 patients had bilateral cysts (10%) for a total of 44 dermoid cysts. The mean cyst diameter measured by Transvaginal ultrasonography was  $6.5 \pm 1.4$  cm (mean  $\pm$  SE) range 5.5-7.6 cm. There were additional procedures beyond dermoid cyst removal consisted of treatment of endometriosis (5 cases), adhesiolysis (3 cases) and non dermoid cysts (2 cases). Intraoperative spillage rate of dermoid cyst contents was 19 cases (47.5%). There is no evidence of recurrence in the follow-up of all patients within six months. Six patients became pregnant during the follow-up period.

**Conclusion:** Using strict adherence to guidelines for preoperative clinical assessment and intra-operative management, laparoscopic treatment of dermoid cysts appears to be a safe procedure. Spillage of the contents of the dermoid cyst does not lead to any complication; perhaps this is due to the liberal irrigation of the peritoneal cavity.

**Key Words:** Laparoscopic surgery – Ovarian dermoid cysts.

### Introduction

**DERMOID** cysts are germ cell tumors of the ovary that account for 20-25% of all ovarian tumors and are bilateral in 10-15% of cases, it is most common in young reproductive age (30) years, so conservative surgical excision or excision or cystectomy is warranted [1,2].

Most of dermoid cysts occur with significant clinical symptoms and they are often discovered

incidentally during pelvic examination or routine ultrasound. The prevalence of malignant transformation in dermoid cysts has been reported as 1-3%.

Traditional therapy for a dermoid cyst has been cystectomy or oophorectomy via laparotomy. The laparoscopic approach has become increasingly accepted since 1989. Because most patients with cystic teratomas of a reproductive age, a conservative approach is ideal; laparoscopy may minimize adhesion formation and thus decrease the chance compromising fertility [3].

### Materials and Methods

Our study included forty patients with diagnosis of unilateral or bilateral dermoid cysts between August 2006 and May 2008. All cases were performed at department of obstetrics and Gynecology, women's health centre, Faculty of Medicine, Assiut University.

*The selection criteria for this study included:*

- 1- No personal or family history of Gynecological malignancy.
- 2- Typical features of dermoid cyst. With no sign of malignancy on pelvic examination and on transvaginal ultrasonography (using Medison 124 (X4), Real time vaginal probe with frequency 5-8 MHz.
- 3- Normal serum tumor marker Ca 125 for all patients.
- 4- Preoperative counseling including information about the risk of complications as well as the possibility of laparotomy in cases of suspected malignancy. Consent was obtained from each patient after making sure they had a full understanding of this procedure.

Patients who had adverse features by transvaginal ultrasonography such as large or multilocular cysts with solid area, complete or incomplete septa, papillae or ascites were excluded from the study.

**Pelviscopic procedure:** those patients were admitted the day before the operation, kept fasting over the night. Prophylactic antibiotic was given to all patients. Triple puncture laparoscopy was performed under general endotracheal anesthesia using (Karl-Storz Laparoscopy Equipment's, Truttlingen, Germany). Patients placed in the lithotomy position with the buttocks extended beyond the edge of the table to facilitate uterine manipulation, with forward tilting of the edge to allow easy access to the lower abdomen. Cleaning of the abdomen, perineum, thighs and vagina with povidone Iodine 7.4% W/V then sterile drapes were applied. Examination under anesthesia was done to prove the suitability of the case.

Collin's speculum was inserted into the vagina and the tenaculum with the uterine elevator was applied to the cervix.

Pneumo peritoneum was achieved through verres needle inserted intraumbilically with the patient in supine position. Automatic CO<sub>2</sub> insufflator was used and preset intra peritoneal pressure not exceeding 15 mmHg. then 10 mm trocar and cannula were introduced into the peritoneal cavity through an umbilical incision. The trocar was removed and 10 mm straight forward telescope angle zero introduced into the peritoneal cavity. For the second and third punctures, the transillumination test was done to outline the major vessels of the anterior abdominal wall, the deep epigastric vessels avoided by direct laparoscopic inspection of the anterior surface of the anterior abdominal wall. The right and left ports 5 mm inserted supra a pubically lateral to the epigastric vessels (a vascular area), slightly higher than the imaginary Pfannenstiel incision [4,5].

After pneumoperitoneum was achieved, diagnostic laparoscopy was done to evaluate the pelvis, and assessment of the ovarian cyst was examined for suspected malignancy, unilateral or bilateral dermoid, presence of adhesion and associated lesions as endometriosis.

The ovary was gently mobilized using grasping using grasping forceps after preliminary adhesiolysis if needed. The size and intraovarian location of the cyst were determined to select the proper site for incision the ovarian capsule. The best site was the antimesenteric portion of the ovary to avoid the hilum with its blood vessels. The ovarian cap-

sule was penetrated by trocar and cannula (5 mm) followed by repeated irrigation aspiration of the cyst cavity. The cavity was examined by 5-mm telescope (ovaroscope) to determine any intracavitary growth as papillae. The cyst wall was excised from the ovary and removed through the secondary trocar (5-mm) if small cyst, but if large cyst the secondary trocar replaced by 10 mm trocar and used claw or toothed grasping forceps (5 mm or 10 mm).

If dermoid cyst rupture and spillage of its contents into the peritoneal cavity occurs, it is essential to remove all of these contents to avoid a chemical peritonitis. This is achieved by copious lavage with lactated Ringer's solution from 8-12 liters by using wide bore suction irrigation cannula. The lavage and suction is continued until the fluid is clear. Haemostasis was carried out when needed by unipolar or bipolar (30-40 w forceps). The reduced part of the ovarian capsule was removed and the ovary was left without suture.

All specimens removed in all cases were sent for pathological examination to confirm the diagnosis.

Approximately one liter of lactated Ringer solution was left in the abdomen to avoid postoperative adhesion.

In all cases no conversion to laparotomy was occurred. Patients were discharged from hospital 24-48 hours after the procedure. All patients were seen one week later to report any postoperative complications. Monthly clinical gynecological examination and pelvic ultrasonography followed patients up for six months.

All data were analyzed using the computerized statistical program, Statistical Package for Social Science (SPSS), version 13.

## **Results**

Forty patients were recruited from the out patient gynecology clinic with a diagnosis of dermoid cyst confirmed by ultrasonographic examination. The mean patient age was 26.4 years (range 19-36), 25 patients were nulliparous and 15 were multiparous.

The main clinical presentation was pelvic pain in 15 patients, menstrual irregularities in 8 patients, infertility in 7 patients; ten patients were asymptomatic which discovered during transvaginal ultrasonography.

Thirty-six patients had unilateral cyst (90%) (RT side 69.4% and Lt side 30.6%) and 4 patients had bilateral cysts (10%) for a total of 44 dermoid cysts. The mean cyst diameter measured by Transvaginal ultrasonography was  $6.5 \pm 1.4$  cm (mean  $\pm$  SE) range 5.5-7.6 cm.

The operative duration by minutes was  $37.8 \pm 2.5$  (mean  $\pm$  SE) range 29-83 minutes, with gas consumption by liters was  $54 \pm 4.3$  (mean  $\pm$  SE) range 44-114 liters, the duration and gas consumption more in cases of bilateral and or large cysts or with associated lesions.

There were additional procedures beyond dermoid cyst removal consisted of treatment of endometriosis (5 cases), adhesolysis (3 cases) and non dermoid cysts (2 cases).

The mean blood loss during procedure was  $75 \pm 50$  ml. The operative time and blood loss for 10 patients who had additional procedures beyond dermoid cyst removal were range 70-83 minutes,  $90 \pm 35$  ml. respectively.

Intraoperative spillage rate of dermoid cyst contents was 19 cases (47.5%), managed with copious saline irrigation, which not ended by any postoperative complications such chemical peritonitis. The spillage was not correlated with cyst size.

Overall hospital stays was 24-48hours (0.8 day). Two patients developed mild subcutaneous emphysema which resolved spontaneously one day after the procedure, an incisional infection at the umbilical trocar site were occurred in four patients within the first week postoperative which resolved after antibiotic treatment.

There is no evidence of recurrence in the fellow up of all patients within six months. Six patients became pregnant during the follow-up period.

Pathological confirmation of definite mature cystic teratomas without atypia were quite clear in all cases, the histopathological findings in non dermoid cysts (2 cases) were serous cystadenoma and corpus luteum cyst.

### Discussion

This study tried to assess the safety and efficacy of laparoscopic approach to dermoid ovarian cyst. Transvaginal ultrasonography and tumor markers helped us to decide the feasibility of laparoscopic management. Operative laparoscopy is rapidly developing and valuable modality of therapy having major role in managing most of the gynecologic benign conditions.

Laparoscopic removal of ovarian masses is a well established procedure [5,6], but controversy exist regarding the selection of the ovarian cysts that can be removed via laparoscopy [4,7].

Gomel and Taylor [8] and Nezhat et al. [5] enumerated the parameters of interest during the ultrasonographic evaluation of an ovarian cyst. These parameters included the size (malignancy more likely with large cyst), the number of loculi (multilocular pattern with septa thicker than 3mm is a hallmark of malignancy), papillary excrescences or presence of solid area. In our study only unilocular cysts with maximum diameter 7.6 cm with no evidence of intracystic papillary growth (by use ultrasonography or during ovariscope) in all cases were included in this study,

Although, Benacerref et al. [9] reported at 15% failure rate in differentiation of benign and malignant cysts during transvaginal ultrasonography, so preoperative tumor markers as Ca1 25 and postoperative histopathological examination was done for all cases. In our study group, there is no abnormal result on serum tumor marker Ca 125 and the histopathological results revealed the accurate benign diagnosis in all cases.

Our laparoscopic operative times are comparable with other laparoscopic reports [10,11,12]. In our study, mean operative times after excluding other operative procedure was 29-83 minutes, also these are comparable with other laparotomy reports. Cristoforonia reported operative times for laparotomy of  $92 \pm 11$  minutes.

Spillage of cyst contents potentially leading to complications such as chemical peritonitis or spread of malignancy is the most important risk in laparoscopic management of dermoid cyst. Spillage rates in laparoscopy are 15-100% compared to only 4-13% via laparotomy [3]. The incidence of spillage was 47.5% in our study group and the rate of chemical peritonitis was nil in 40 patients undergoing laparoscopic cystectomy.

The role of wash irrigation with copious amount of fluid removing all particles of cyst contents is the gold standard to avoid any complications. There was no significant difference in complication rates among spillage and non spillage groups in our study. The suction irrigation during laparoscopic procedures better than laparotomy due to:

- During laparoscopy, the pneumoperitoneum and bowel retraction better exposure of Douglas pouch.

- During laparotomy, it's difficult to aspirate back again all irrigation fluid due to its collection to upper abdomen and subphrenic recesses.

Shawki et al. [13] reported that spillage rate decrease up to 10% by removal of cyst within endobag.

In fact, in cases who reported post operative spontaneous pregnancy (3/6) had spillage of the cyst contents during the procedure.

As has previously been established; hospital stay, blood loss. Patient morbidity and cosmetic results may be significantly better with laparoscopy compared to laparotomy.

Laparoscopic ovarian surgery is now a method of choice due to its advantages, most of which focus on preserving ovarian tissue and minimizing postoperative adhesion formation in reproductive age women (Templeman et al. [14] and Koca et al. [11]). This study demonstrated similar outcomes in patients treated via laparoscopy for dermoid cysts. Although there were no clinically relevant adverse effects, this study did not have sufficient power to detect changes in serious rare adverse outcomes.

#### Conclusions:

We conclude that this study demonstrated the efficiency and safety of laparoscopic surgery in the management of ovarian dermoid cyst. The advantages of operative laparoscopy such as a short recuperation, time and hospital stay, less blood loss, lack of complications, and less invasive procedures were shown in this study. However, proper early qualification, based on medical history, gynecological and sonographic examination is of great importance. Spillage of the contents of the dermoid cyst does not lead to any complication; perhaps this is due to the liberal irrigation of the peritoneal cavity.

However, prospective controlled clinical trials with a large number of patients are necessary to compare conventional methods with laparoscopy in cases with teratomas and to assess more rare events like undetected malignancy, chemical peritonitis or excess adhesion formation.

#### References

- 1- MORROW C.P. and CURTIN J.P.: Synopsiss of gynaecologic oncology. 5<sup>th</sup> Ed.Los Angeles Churchill Lirington, 1999.
- 2- DARBY B. and CURLING G.: Bilateral Dermoid cysts N. England J. Med., 346 (2): 139, 2002.
- 3- NEZHAL C., KALYONCU S., NEZHAT C., et al.: Laparoscopic; management of ovarian Dermoid cysts: ten years experience J SLS(S), 179-184, 1999.
- 4- HULKA J. and REICH H.: Textbook of Laporoscopy (eds) 3rd edition; Londoc, Toronto, Sydney, Tokyo. W.B. Saunders Company Ltd, 1998.
- 5- NEZHAT C.R., SIGLER A., NEZHAT F.R., et al.: (eds). Operative Gynecologic laporascopy: Principles and techniques, 2nd edition New York: MC Grow-Hill, 2000.
- 6- GANIS M., BOTCHORISHVILLI R., WATTIEZ A., et al.: Laparoscopic treatment of endometinoma cystectomy or destruction? Gynecol. Obstet. Fertil., 28 (7): 584-6, 2000.
- 7- KAMINSKI P., GAFEWSKA M. and WIELGOS M.: Laporoscopic management of desmoids cysts, in patients of reproductive age. Neuroendocrinal Lett, Vol. 27. (6), 2006.
- 8- GOMEL V. and TAYLOR P.J. (eds): Diagnostic and operative gynecologic laparoscopy, New York, Philadelphia, Sydney, Tokyo-Mosoby-Yeak book Inc., 1995.
- 9- BENACERRAF B., FINKLER N., WOJCIECHOWSKI C. and KNAPP R.: Sonographic accuracy in the diagnosis of ovarian masses. J. Reprod Med., 35: 491-495, 1990.
- 10- SONMEZER M., GUNGOR M., CENGIZ B. and ORTAC F.: Laparoscopic extracorporeal cystectomy in the management of large dermoid cysts. Gyn. Endo., 11 (4): 201-204, 2003.
- 11- KOCAK M., DILBAZ B., OZTURK N., et al.: Laparoscopic management of ovarian dermoid cysts: a review of 47 cases. Ann. Saud Med., 24 (5): 357-360, 2004.
- 12- MILLINGOS S., PROTOPAPAS A., DRAKAKIS P., et al.: Laparoscopic treatment of ovarian dermoid cyst: Eleven years experience. Minimally Invasive Gynecology, 11 (4): 475-485, 2004.
- 13- SHAWKIO, SOLIMAN I., EBROSHY A., ELSADEK M. and BAHANASSY A.: Laparoscopic, management of ovarian dermied Cyd. Middle east fertiligy Society J. Vol., No. 1, 2004.
- 14- TEMPLEMAN C.L., FALLAT M.E., LAM A.M., PERLMAN S.E., HERTWEEK S.P. and O'CONNOR D.M.: Managing mature cystic teratomas of the ovary. Obstet. Gynecol. Surv., 55 (12): 738-745, 2000.

Removal of ovarian cyst was done laparoscopically without significant complications. The remaining of her pregnancy was uncomplicated, and she delivered a healthy infant at term. Conclusion: Laparoscopic cystectomy is safe and should be the gold standard in pregnant women. Keywords: Laparoscopy; Minimal invasive surgery; Recurrent ovarian cyst; Pregnancy.Â The cyst was then placed into an Endo-bag and removed via a 10mm port which was converted from a 5mm port at the left iliac fossa without spillage of cyst content into the pelvic cavity. The remaining ovarian tissue was refashioned using non-absorbable Prolene 3/0 and hemostasis secured. Peritoneal cavity washed with 1000cc normal saline. The whole procedure was completed within 35 minutes with very minimal blood loss. Conclusion: Laparoscopic ovarian cystectomy is effective for large ovarian dermoid cysts. Keywords: Mature cystic teratomas also termed dermoid cysts, are the most common benign ovarian tumors. They account for up to 58% of benign and 44% of all ovarian tumors (1). Most (80%) occur during reproductive years and only 15% after menopause. They are bilateral in up to 15% and they grow slowly.Â The records of women with large ovarian dermoid cyst were identified and examined. Inclusion criteria included maximal diameter of the cyst was less than 10 cm, tumor markers and radiological picture suggestive of benign disease, and absence of contraindications for operative laparoscopy.