Is laparoscopic surgery a safe treatment of large serous cystadenomas? :

A case report and literature review

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Abstract

Background: Serous cystadenoma constitutes a truly common benign ovarian tumor which ranges in diameter from 3cm to 40cm. The main purpose of this case report is to present the successful treatment of a huge serous cystadenoma by a special laparoscopic technique without any postoperative complications.

Case presentation: We report a case of a serous cystadenoma in a 67-year-old woman from Greece who presented with abdominal distension and non specific abdominal pain. Computerized tomography and ultrasound revealed huge ovarian serous cystadenoma from the right ovary with the dimensions 13,5cm x 11,4cm x 19,5cm. The cyst was completely excised by laparoscopic surgery and histopathologic findings confirmed the diagnosis. Postoperatively, she had a quick recovery and she was discharged on postoperative day 3 without any complications. The patient has shown no recurrence after a follow-up of six months.

Conclusion: Current contradictory opinions about laparoscopic treatment of huge serous cystadenomas set Laparotomy as the standard management. However, Laparoscopic surgery should be a safe treatment of choice even in patients with large serous cystadenoma as can assure the complete tumor excision and reduce the probability of intraperitoneal diffusion of cancerous cells with the proper handling. Furthermore, this procedure leads to a quick recovery and discharge without any postoperative complications.

Keywords
Large, serous cystadenoma, laparoscopy, ovarian, fallopian tube, safe, cystectomy
**Background**

Serous cystadenoma constitutes a histologically benign ovarian neoplasm which originates from ovarian epithelium [1]. This kind of tumor is very common with the incidence of 50% and it can be appeared in every age with a strong tendency to occur between the ages of 45 and 60 years, in menopausal or postmenopausal period [3, 12]. Macroscopically, serous cystadenoma is usually unilocular, its diameter ranges from 3cm to 40cm and it is 33% bilateral. Moreover, it consists of truly thin cyst walls and contains serous, thin, achyrochrous liquid. Microscopically, cyst wall is lined by single cyboidal epithelium such as the epithelium of fallopian tubes [3]. We herein report a case of a sizable serous cystadenoma in a 67-year-old woman and we describe the findings of the lab tests and the laparoscopic surgical treatment which we carried out.

**Case presentation**

A 67-year-old Greek female patient presented to our hospital with a large abdominal distension complaining of non specific abdominal pain and heaviness. Past medical and family history were unremarkable as well as her gynecological history, with menarche at the age of 15 and menopause at the age of 52. Her general condition and vitals signs were normal. During physical examination, the abdomen was found distended and a large mass was palpable to the inferior abdomen and to the lesser pelvis. A US (ultrasound) examination of the abdomen was performed and showed a huge abdominal thin- walled cyst spanning the abdomen and pelvis with no evidence of any solid element or any papillary projections arising from either internal or external wall surfaces. Liver, spleen and kidneys were normal and pancreas
was not seen. An immediate CT (computerized tomography) scan was carried out and revealed a large (13, 5 cm x 11, 4 cm x 19, 5 cm) cystic mass spreading from the right ovary and the right fallopian tube to the inferior abdomen and the whole lesser pelvis (Figure 1). Due to the huge size of the cyst, its origin could not be well defined. Abnormalities in uterus and left ovary did not detected and CT scan excluded dilatation of indigenous inguinal or cervical lymphatic glands, infiltration of adipose tissue or ascites. Overall morphological view did not indicate malignancy. Her laboratory results were in normal range except from CRP that was measured 3, 27 mg/dl (0-0,5 mg/dl). Moreover, CA 125 was measured 20 U/ml which is in normal ranges (0-30 U/ml). On the day of admission, after a preoperative consultation and considering the low risk of malignancy, the patient and her family opted for laparoscopic cystectomy. We performed a wedge resection of the ovary and a right salpingo-oophorectomy.

**Operation Details**

After appropriate pre-operative care, surgical laparoscopy was carried out under general anaesthesia by endotracheal intubation. The patient was placed supine in a trendelenburg 20° position, after insufflation of CO₂ (2, 5 lt), under 12mmHg pressure, in order to create pneumoperitoneum. Afterwards, we inserted a camera (0 degree) through the first 10mm trocar, above the umbilicus, into the peritoneal cavity, to visualize the exterior of the cyst and we checked the whole peritoneal cavity. The secondary 10mm trocar was placed, laterally, to the right outer edge of rectus abdominis muscle and another 5mm to the left side. The cyst appeared to be arising from the right paraovarian region (Figure 2). We used ligature systems in order to separate
the cyst from the connective tissue and adhesions. After the above procedure, we used a grasping forceps to catch the cyst puncture site. Continually, our first effort was to set the whole cyst into an endobag without causing any rupture of its wall in order to be completely excised. However, we did not manage to use an endobag because of the large size of the cyst, so we tried an alternative, uncommon maneuver. When we caught the cyst, we managed to move it just below the umbilical portside. Afterwards, we aspirated the content of the cyst placing a 5mm trocar in combination with aspiration system into the cyst, to prevent leakage, and we pulled out the cyst from the umbilical incision of the first trocar (Figure 3). This new aspirating management externally the peritoneal cavity was effective as we excised the whole serous cystadenoma without causing any rupture or intraperitoneal diffusion of serous fluid. The whole procedure lasted about 55min. The whole procedure exists in a short movie file.

In addition, we placed drainage and specimen as well as the cystic fluid was sent for histopathology and cytological examination. Postoperatively, the patient had an uneventful recovery and she did not present any complications, too. The recovery was quick and she was discharged on post op (postoperative) day 3.

Pathology report showed a unilocular cyst with no solid areas and the cyst wall was lined by single cyboidal epithelium. All the features were consistent with benign serous cystadenoma.

At her latest review 6 months after surgery, she has presented no symptoms, and there has been no recurrence of the cyst on examination.
Discussion

Cystadenoma is about 20% of all ovarian neoplasms [3]. Embryologically, it originates from mesothilium of peritoneal cavity, so it can be divided into serous and mucinous type accordingly with cell differentiation [1]. Furthermore, this neoplasm can not produce ovarian hormones. As a result, it does not cause menstrual disorders [1, 12].

Serous cystadenoma, especially, is a very common benign ovarian neoplasm which can obtain a very large size as they can grow even in 40cm in diameter and form spherical masses [3, 13]. About 70% of all serous cystadenomas are benign tumors, 5-10% have borderline malignant potential and 20-25% are malignant. This neoplasm is usually presented at menopause, during the fifth decade of life [12, 13]. The macroscopic morphology that is indicated for benign cystadenoma is a unilocular cyst with thin and fibrous wall which contains serous achyrochrous fluid [3, 6]. Microscopically, the wall of cyst is consisted of cyboidal cells similarly with the epithelium of fallopian tubes [1, 2, 6]. Such a benign, large, unilocular cyst with dimensions of 13, 5cm x 11, 4cm x 19, 5cm is reported here.

Benign serous cystadenoma is one of the largest contemporary challenges of medicine according to diagnosis and treatment, as well. Diagnosis is difficult enough, especially at primary stages and at small cysts, as clinical overview is not characteristic [1]. As a general rule, benign serous cystadenoma is asymptomatic or lacks specific symptoms, so it is usually of a great size when the patients are presented to hospital. Pain is quite rare except for rupture, inflammation or ovarian torsion [13]. Furthermore, large cysts extend from the lesser pelvis to the whole abdomen [6]. The findings of physical examination are
not identical, too. During gynaecological examination, a spherical, painless mass is revealed. An additional CT scan and US can be carried out to clarify the diagnosis [4, 5, 7, 13].

Treatment is another complicated field of serous cystadenomas. All the ovarian tumors with size more than 5cm must be excised immediately because of probable malignancy and possible complications besides the histopathological type of tumor or the grade of differentiation. Nowadays, there are two surgical options for the treatment of serous cystadenoma: laparotomy and laparoscopy [1, 2, 3, 5]. Although, both of these techniques must be always followed by histological examination of the cyst in order to exclude malignancy [1, 7, 12, 13].

A necessary target about the treatment of serous cystadenoma is to be decreased the danger of cancerous cells’ implantation. This implantation and metastasis can be carried out by consecutive tissue, through lymph’s or blood’s circulation and intraperitoneal diffusion [5]. The last type is the most common and follows the flow of intraperitoneal fluid to the right side. Cancerous cells are transferred with serous intraperitoneal fluid, especially after the rupture of the cyst wall, along the colon where they are implanted, and then towards the subdiaphragmatic region and the Glisson’s capsule. This transfer is facilitated by the different levels of pressure during respiration [4].

Since 1930, gynecologists from France and Germany lead onto the application and development of laparoscopic surgery and set presumptions and inquiries for which technology should give answer with a delay of some decades. Laparoscopic surgery contributes a truly significant field in gynecology. Kurt Semm performed laparoscopic gynecological operations like cystectomy and
hysterectomy from 1965 to 1980 with laparoscopic equipment and techniques such as suture, aspiration and ligotion as they are used until nowadays [9]. In the last 15 years, laparoscopic treatment of ovarian cysts has developed in a great degree instead of the primary absence of elements that could compare surgical laparoscopy with laparotomy for sizable ovarian cysts. The performance of laparoscopic surgery in cases of huge ovarian cysts is controversial and is globally carried out successfully in a low percent [8, 11].

We searched medical literature since 2000 in Pubmed by using key words ‘large serous cystadenoma, laparoscopic cystectomy, huge ovarian cysts’ and we selected relevant articles. We analyzed this database according to the date, the size of serous cystadenoma and the technique of treatment. We found out only 13 papers of large ovarian cysts managed by laparoscopy (Table 1).

Surgical laparoscopy is a relatively minor procedure that allows the visualization of intraperitoneal cavity or other indigenous organs and the performance of several operations without open laparotomy. The benefits of laparoscopic treatment of benign ovarian cysts are explicit and multiple. The morbidity is always less significant than similar major surgery performed by laparotomy, the operating time is also reduced, the postoperative pain and the other complications are rarely presented, the recovery is improved, the discharge is quick and the patient returns to their daily routine in a couple of days [2, 3, 5, 7, 9, 11, 12].

On the other hand, the major problem that laparoscopy appears is the intraperitoneal diffusion of cancerous cells and the danger of possible implantation which can lead to metastasis. Although, accordingly with a study Dembo (1990) the factors that contribute the recurrence of the disease, after
laparoscopic surgery to 519 patients with ovarian CA (cancer) stage I, are the grade of differentiation, the existence of fixed adhesions, and ascites instead of the cyst’s rupture. Other serious problems especially for huge serous cystadenoma are caused by the limited working place, the risk of cyst rupture and the intraoperative cardiorespiratory function [7].

Even if all the preoperative examinations have features of a benign cystadenoma, frozen section pathological evaluation can be obtained intraoperatively to diagnose or exclude malignancy [10]. Where malignancy is suspected, laparoscopy is contraindicated and a median laparotomy is appropriate for radical extirpative surgery [1]. Then, the external surface of ovaries is checked and any adhesions should be cut in order to be visual. If all the indications reveal a benign serous cystadenoma, aspiration of the cyst follows into an endobag [3, 5].

In this case report, the sizable serous cystadenoma that we presented, is the largest benign ovarian serous cystadenoma in our hospital which was treated laparoscopically in combination with a new aspiration system externally the peritoneal cavity. Based on the huge size of this serous cystadenoma, the use of an endobag was ineffective. However, the immediate extract of the cystadenoma from the umbilical incision, after its aspiration, leaded to successful, complete excision of cystadenoma. This method is based on macroscopic and immediate extract of the cyst so as to reduce the danger for intraperitoneal diffusion of cancerous cells.

**Conclusion**

Generally, laparoscopic surgery has been developed in a great extend in the last few years and has gained a main role in treatment of small ovarian cysts.
This case report demonstrates that a laparoscopic ovarian cystectomy even in a huge serous cystadenoma is absolutely safe procedure, as can avoid intaperitoneal diffusion. Furthermore, the justification for adoption of this laparoscopic technique would depend on the perceived value of its effectiveness in improving short-term postoperative outcomes, especially quick recovery and discharge. In our opinion, the method that we described, gives an alternative option about successful laparoscopic surgery of truly huge serous cystadenoma.
**Consent**

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

**Abbreviations**

US: Ultrasonography  
CT: Computerized Tomography  
CRP: C-reactive protein  
CA: cancer  
post op: postoperative

**Competing interests**

The authors declare that they have no competing interests.

**Authors’ contributions**

PM, RK and TC performed the new application of laparoscopic surgery which is described.  
BS was responsible for the pictures and video during the surgery.  
KG, IC and NEA participated in the design of the report, analysed and interpreted the patient data regarding serous cystadenoma.  
SC reviewed the manuscript and gave the final commentaires.  
All authors read and approved the final manuscript.
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The bibliography and links can be viewed at http://www.ncbi.nlm.nih.gov/pubmed.
Figure 1
CT scan reveals a sizable cyst 13.5cm x 11.4cm x 19.5cm originating from the right ovary extending from the lesser pelvic to the umbilicus. There are no signs of malignancy.

Figure 2
Intraoperative view of the huge serous cystadenoma into the abdomen and pelvic by laparoscopic endoscope.

Figure 3
Macroscopic view of the excised serous cystadenoma.
Additional files provided with this submission:

Additional file 1: MichaelTable1.doc, 50K
http://www.biomedcentral.com/imedia/2060429757591263/supp1.doc