Original Article

The laparoscopic management of large ovarian cysts

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Abstract

Objectives: To assess the laparoscopic management of large benign ovarian cysts as opposed to laparotomy. **Methods:** One hundred and thirty two women with ovarian cysts larger than 18 weeks pregnancy were managed laparoscopically. Five of these were borderline tumors. The cysts were aspirated laparoscopically and removed from the abdomen either by direct extraction, cutting into strips, electric morcellation or extraction through the posterior vaginal fornix. **Results:** All the women were successfully treated and there were no complications. There were five borderline tumors and no frank malignancy. Follow up for 4 years revealed no malignancy. **Conclusions:** It is recommended that this is a satisfactory method of managing large benign cysts in carefully selected cases. However the exclusion of malignancy is mandatory.

Key words: ovarian cysts, laparoscopic management

Introduction

Large ovarian cysts have been conventionally removed by laparotomy. Laparoscopic management has been controversial mainly because of the fear of unrecognized malignancy and also the technical difficulties encountered when removing the large tumor from the abdomen. One further concern is the incidence of borderline tumors, the diagnosis of which may not be possible before operation.

Material and Methods

Over a period of 4 years (January 1999-December 2002) 132 benign ovarian cysts were managed

laparoscopically in the Department of Gynecology, McCord Hospital. Of these 20 (26, 4%) were very large ovarian cysts averaging in size from 18 weeks to full term pregnancy. There were 1 of 18 weeks size, 2 of 20 weeks size, 3 of 24 weeks size, 1 of 28 weeks size, 3 of 30 weeks size, 3 size 34 weeks size, 1 of 38 weeks size, and 5 of full term. There were 5 (25%) borderline tumors. There was no case of frank malignancy. The ages ranged from 18 years to 79 years. The average age was below 30 years. The parity of the patients ranged between 0 and 3. Five of the patients were nulliparous.

Frozen section was available, but was not used because it was not practical, as in cysts of this size it was not possible to decide where to take the biopsy from. The histology findings were: 9 serous cystadenomas (2 borderline), 7 mucinous cystadenomas (3 borderlines), 1 mixed dermoid and serous cystadenoma, 1 endometrioma, 1 pure dermoid and 1 unknown, but not malignant.

The volume of fluid aspirated from the cysts ranged between 1 to 10 liters.

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A high percentage of these patients were obese. The range of weight of the patients was 65 kg to 100 kg.

Having been satisfied that the cyst was benign by history, clinical examination, CA 125, ultrasound and MRI scan, operation was decided on. This could be accomplished in the following ways: 1) Laparotomy with a large midline incision from xiphisternum to pubis. Even if this is performed it may not be possible to remove the tumor intact in a small percentage of cases. It is necessary to empty the cyst by some form of aspiration, which results in spill. 2) A small suprapubic incision can be made and a purse string suture inserted around a suction cannula. The fluid is aspirated and the tumor removed through the incision. 3) Laparoscopic removal. This was the procedure chosen

Operative procedure

The pathology and intended procedure were fully explained to the patient. It was explained that the cyst was not malignant but in some instances (borderline tumors) the potential for malignancy exists in which case more radical surgery and an open procedure may be necessary. However, it should be anticipated that the affected ovary would be removed provided the other was normal. In very large cysts an abdominoplasty may be necessary at a later stage.

General anesthesia as commenced with muscle relaxation and intratracheal intubation. The patient was left in the prone position and a Foley catheter inserted into the bladder. The patient's legs were placed into Anderson leg pieces. A Veress needle was inserted intraumbilically directly into the cyst and aspiration of fluid was commenced with positive suction. However, this is very slow; therefore, a 5mm port was inserted on the right side at a point opposite the right iliac crest lateral to the lateral border of the rectus muscle. This was inserted directly into the cyst and positive pressure aspiration was commenced until the abdomen was flat. Prior to inserting the 5mm trocar on the right side bowel was excluded by ultrasound. CO₂ insufflation was commenced through the Veress needle which had remained in position intraumbilically. Stamatellos et al¹ described the insertion of a 5mm trocar and cannula into the cyst to empty it to assist removal from the abdomen; this is after careful exclusion of malignancy. Their paper analyses 211 premenopausal patients with ovarian cysts managed laparoscopically.

Once the abdomen was distended to a satisfactory

degree the Veress needle was withdrawn and replaced by a 7mm trocar and cannula through which a 7mm telescope was placed. A 7mm telescope was used in place of a 10mm telescope as this gives completely satisfactory vision. Careful inspection of the abdominal cavity, peritoneum, pelvis and cyst was performed as well as aspiration of peritoneal fluid for cytology. Inspection of the cyst cavity for papillae was also performed. If there was no evidence of malignancy, three further ports were inserted. The 5mm port on the right side was replaced by a 10mm port. A 5mm port was inserted in a corresponding position on the left side. A 5mm suprapubic port was inserted. All of these were inserted under direct vision. A decision was now made as to what procedure would be performed, having carefully inspected the normal ovary. If cystectomy was not performed the cystic ovary was mobilized and separated from its blood supply and attachments. After it was emptied it was removed from the abdomen either by direct removal through the 10mm port wound or if this was not possible the cyst was either cut into strips with a scissor or morcellated electrically, and then removed through the 10mm port. The former is very time consuming. These cysts are too large to put into a bag. However, it is now felt preferable to remove the cyst through the posterior vaginal fornix. The abdomen and pelvis were thoroughly irrigated. The port sites were closed with glue.

There may be criticism about stripping or morcellating a cyst. On discussing this with the pathologist here was no problem in interpreting the histology.

The concern is that when cutting or morcellating borderline tumors abnormal cells may be disseminated. In the literature mention is made of morcellation in the management of suspicious ovarian cysts and division of ovarian cysts to remove them ^{2,3}.

Follow up upto 4 years revealed no case of malignancy including the borderline tumor.

The high incidence of borderline tumors and the technical difficulties in performing cystectomy leaves oophorectomy as the procedure of choice. In the 79 year old patient who underwent a total abdominal hysterectomy with bilateral oophorectomy for a mucinous cystadenoma the size of a full term pregnancy, the cyst was first emptied laparoscopically before proceeding to open operation. This avoided the necessity to perform a large abdominal incision in a

patient of this age. The emptied cyst and uterus could be removed through a small Pfannenstiel incision.

Two problems remain: 1) Removal of the large tumor from the abdomen. 2) Whether or not the tumor is borderline.

Nine cysts were cut into strips with a scissor and extracted through the 10mm port, four were morcellated electrically before extraction, one was extracted directly through the 10mm port wound, one was extracted

through the posterior vaginal fornix, two were removed at the time of total abdominal hysterectomy after the cyst had been emptied laparoscopically to reduce its size and three were removed at the time of LAVH.

There were no complications encountered.

Results and analysis
Table 1 shows the patients' profile, age, parity, operation performed size of cyst, volume of fluid aspirated, histology, borderline tumors and method of extraction.

Table 1. Shows the patient s profile - age, parity, operation performed, size of cyst, volume aspirated, histology, borderline tumors and method of extraction.

Age	Parity	Operation	Size in weeks	Volume	Histology	Borderline	Method of extraction
18	0	OOPH	34	1.5L	SCA	No	MOR
21	0	CYST	24	Unknown	ENDO	NO	EXT
24	0	OOPH	38	2.5L	SCA	YES	CUT
Unknown	1	OOPH	FT	5L	SCA	NO	MOR
31	?	OOPH	26	1L	MCA	YES	MOR
31	0	OOPH	24	Unknown	MCA	NO	CUT
31	0	OOPH	20	Unknown	SCA	NO	CUT
32	1	OOPH	30	1.1L	SCA+DER	NO	CUT
33	1	OOPH+LAVH	30	1L	MCA	Yes	LAVH
33	UNKNOWN	CYST	18	Unknown	MCA	No	CUT
35	UNKNOWN	CYST	34	1L	SCA	NO	CUT
42	3	OOPH+LAVH	FT	8L	MCA	NO	LAVH
47	3	OOPH+LAVH	24	1L	DER	NO	LAVH
47	3	OOPH	28	1.2L	SCA	NO	CUT
48	Unknown	OOPH	FT	5L	SCA	YES	CUT
55	Unknown	OOPH	30	1L	MCA	NO	MOR
66	2	OOPH	34	2L	SCA	NO	TAH
Unknown	1	OOPH	FT	10L	Benign	NO	CUT
76	Unknown	OPOH	20	1L	SCA	NO	P of D
79	Unknown	OOPH+TAH	FT	5L	MCA	YES	TAH

Key words

DER	=	Dermoid
ENDO	=	Endometriosis
SCA	=	Serous Cystadenoma
MCA	=	Mucinous Cystadenoma
MOR	=	Morcellate
OOPH	=	Oophorectomy
EXT	=	Extract
CYST	=	Cystectomy
FT	=	Full Term

Discussion

On searching the literature no mention is made of the possible dissemination of cells in borderline tumors.

Another point of controversy is the removal of dermoid cysts laparoscopically. Laparoscopy should be considered the method of choice for the removal of benign dermoid cysts as it offers the advantages of reduced pain, shorter hospital stay, better cosmetic results and fewer adhesions ⁴.

Dermoid cysts develop bilaterally in 15% of the cases. Therefore, careful inspection of the other ovary should be carried out with bisection if necessary, if any doubt exists as to the existence of bilateral tumors.

Whilst every effort is made to avoid spill it is at times unavoidable in large tumors whether done by open operation or laparoscopy. If the cyst ruptures during removal it is grasped in an attempt to seal the hole and stop the leakage of its contents. The pouch of Douglas is filled with saline to minimize the risks of chemical peritonitis. If the cyst contents are solid, sections of the cyst have to be morcellated by scissors. With meticulous washing out all spill, contents can be removed without subsequent infection or chemical peritonitis. It has been shown that with copious saline irrigation, postoperative chemical peritonitis is less than 1% ^{5,6}. Reverse Trendelenburg position is important at the end of the procedure to optimize the results of lavage. However, there does remain one technical problem when there is a large hair bolus which is not compressible and is too large to remove through a 10mm port wound. This can be removed piecemeal which is very time consuming. Preferably it should be removed through the posterior vaginal fornix. Forty three patients are described where spill occurred in the removal of dermoid cysts and there was no residual infection or peritonitis ⁵.

In mucinous tumors careful and adequate irrigation must be performed to remove as much mucinous material as possible.

This paper highlights the advantages of managing very large ovarian cysts laparoscopically. Pelosi ⁷ and Ang et al ⁸ record the management of enormous ovarian cysts the size of a full term pregnancy, laparoscopically. Their reports quote one case each only and no mention is made of borderline tumors. The present report analyses 20 cases, the largest number reported in the

literature to date. However, it also emphasizes two possible disadvantages. These are the incidence of undiagnosed borderline tumors and the difficulties encountered in removing the large mass of tissue from the abdomen. In very large ovarian cysts, oophorectomy is the procedure of choice. Cystectomy can be extremely difficult both at laparotomy and laparoscopy. The incidence of borderline tumors must not be forgotten. The advantages of laparoscopic removal outweigh those of open operation. A large abdominal wound is avoided and also all of the other disadvantages of open surgery. What can be accomplished by open surgery can also be done equally well by laparoscopy. With cysts of the size described it is usually necessary to aspirate fluid before removal, whether by open operation or laparoscopy. This results in spill in a large percentage of cases. Stamatelos et al ¹ describe cyst aspiration in large cysts to aid their removal by laparoscope, after malignancy has been excluded.

The difficulty of removal of the large mass from the abdomen can be overcome satisfactorily by removing it through a posterior vaginal colpotomy.

Secondly, the incidence of borderline tumors appears to be high and this is the cause of some concern. Besides the technical difficulty associated with cystectomy the high incidence of borderline tumors is a further indication for oophorectomy. This is the correct treatment for borderline tumors whether done by open operation or laparoscopy.

The cause of concern in the extraction of the mass from the abdomen if there is a borderline tumor present is that it is not known if the methods of extraction can disseminate tumor cells. There is no clear mention in the literature regarding this. Morcellation and division of the cystic ovaries are mentioned in the management of suspicious ovarian tumors ^{2,3}. It is maintained that laparoscopic management is possible in the early stages of the disease ⁹. There is no report in the literature on cell dissemination and long term results of this method of managing borderline tumors. Further investigations of this are necessary.

The question of spill even if a tumor is malignant is controversial and in stage 1 invasive epithelial ovarian cancer promptly treated does not seem to alter the prognosis ^{9,10}. However, recent evidence challenges this belief ¹¹.

Magnetic resonance imaging appears to be promising in the diagnosis of malignant ovarian tumors, including borderline tumors. Ultrasound is not helpful in the diagnosis of borderline tumors¹². Borderline tumors have long been discussed as separate entities. Nevertheless WHO has defined them as those gathering most but not all the general morphological features of malignancy. Their rate represents 15% of all the ovarian cancers. In general it is said that the 5 year survival is near 95%.

CA 125 has not been found useful in the diagnosis of borderline tumors. CA 125 was normal in the five cases of this series. However, one study found raised levels of CA 125 in borderline tumors especially in the serous type¹². This was not the case in the present series.

Frozen section is not practical in very large ovarian cysts. It may be argued that frozen section may be able to diagnose borderline tumors but one of the problems is where to take the biopsy from.

In such large tumors the treatment will remain the same whether by open operation or laparoscopy. The ovary bearing the cyst should still be removed by either method. This study highlights the limits of inherent difficulties of frozen section when used in the context of laparoscopic management of suspicious ovarian cysts².

Conclusion

The laparoscopic management of very large ovarian cysts can be criticized but the advantages outweigh those of open operation. The source of criticism can be leveled at the management of borderline tumors. However, the immediate outcome of the management of very large ovarian cysts by open operation or laparoscopy appears to be the same. Further study needs to be done pertaining to the long term outcome of the management of borderline tumors.

The follow up period in the present series is no longer than 4 years and to date no cases of malignancy have been seen. A far longer period of follow up is necessary.

Laparoscopic management of very large ovarian cysts is satisfactory in carefully selected cases.

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