



# Laparo-endoscopic Approach for Large Ovarian Cyst in the Morbidly Obese: Case Report

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## Abstract

We report a successful case of laparo-endoscopic single site total hysterectomy and bilateral salpingo-oophorectomy (LESS THBSO) using conventional laparoscopic instruments for a large ovarian cyst in a morbidly obese woman. A 58-year-old female with a BMI of 46kg/m<sup>2</sup> complaint of abdominal distension. A pelvic ultrasound revealed a left ovarian cyst measuring 21.3 x 15.2 x 20.8 cm. The IOTA score is 3.5% and the RMI score was 51, suggesting a benign pathology. LESS THBSO was performed and the final histology was a benign ovarian mucinous cystadenoma. The patient recovered well with no postoperative complications. This case demonstrates that LESS is feasible for large ovarian cysts even in morbidly obese patients when appropriate cases are selected and when the patient is managed in a multi-disciplinary team.

**Keywords:** *Gynaecologic Surgery, Hysterectomy, Minimally Invasive Surgery, Morbid Obesity, Ovarian Cysts*

## Introduction

Large ovarian cysts were defined as cysts measuring more than 10cm in diameter in the radiological scan or those cysts reaching above the umbilicus <sup>[1]</sup>. Traditionally, laparotomy was preferred for these masses due to concerns of malignancy and the challenges of laparoscopy including technical difficulties, poor visibility and the risk of rupture of a malignancy which upstages the cancer <sup>[2]</sup>.

Additionally, surgeons find it challenging to perform laparoscopic hysterectomy in the morbidly obese due to technical difficulties and the inability of the patient to tolerate the Trendelenburg position. As a result, the rate of conversion to laparotomy is 3 times higher in the morbidly obese <sup>[3]</sup>.

Moreover, the cardiorespiratory changes seen during laparoscopic hysterectomy makes the procedure less ideal for patients with cardiorespiratory compromise. Such compromise frequently occurs in obesity due to its physiologic changes and is aggravated by obesity associated co-morbidities.

Despite the considerations above, we describe a case of a laparo-endoscopic single site total hysterectomy and bilateral salpingo-oophorectomy (LESS THBSO) using conventional laparoscopic instruments for a large ovarian mass in a 58 year old female with a BMI of 46kg/m<sup>2</sup> who has multiple co-morbidities. To the best of our knowledge, this is the first report of a LESS THBSO being done for a large ovarian mass in a morbidly obese woman.

## Case

A 58-year-old married female, BMI 46kg/m<sup>2</sup>, with 3 previous normal vaginal deliveries, was referred from another hospital for a large left ovarian cyst. She presented to the first hospital due to worsening dyspnea attributed to decompensated heart failure. During the hospitalization, she complaint of abdominal distension and a computed tomography thorax, abdomen and pelvis (CT TAP) was eventually performed, confirming the presence of a large left ovarian cyst. A pelvic ultrasound (US) was performed and the cyst measures 21.3 x 15.2 x 20.8 cm. The CA 125, IOTA score and calculated RMI are 16.9, 3.5% and 51 respectively, which supports a low risk of malignancy.

There was no abnormality in her menstrual history. She is post-menopausal with no vaginal bleeding.

Her significant past medical history includes congestive heart failure, chronic Type 2 respiratory failure secondary to obstructive sleep apnea, ischemic heart disease, atrial fibrillation and cerebrovascular disease. She is currently on nocturnal continuous positive airway pressure (CPAP) machine for her OSA. Her current medications include bisoprolol, losartan and warfarin. She had a previous angioplasty done for ischemic heart disease.

On inspection, the patient has a large habitus and no abdominal scars were noted. Her abdomen was non-tender but it was distended with skin-colored abdominal striae. No abnormalities were noted on cervical exam.

Given the new finding of a symptomatic left ovarian cyst, the patient was keen for surgery and she was counselled for a LESS THBSO with frozen section.

A multi-disciplinary team including a gynaecology oncologist, cardiologist, respiratory physician, anesthetist and physiotherapist was involved in her care. The cardiologist managed the patient's heart failure and atrial fibrillation. She was given beta-blockers, angiotensin converting enzyme (ACE) inhibitors and frusemide. 5 days prior to surgery, she was to be admitted for bridging clexane therapy since she was on warfarin. The respiratory physician optimized her OSA by reinforcing compliance to CPAP machine and advised for extubation to CPAP after the surgery, with oxygen saturation targeted at 88-92% in view of her chronic respiratory failure. At the same time, the physiotherapist initiated intensive chest physiotherapy and incentive spirometry to improve her lung function. The anesthetist recommended the avoidance of opioids postoperatively in view of the patient's OSA.

The patient's preoperative hemoglobin was 11.8. Upon optimization of her co-morbidities preoperatively, laparoscopic surgery was proceeded. The patient was cleaned, draped and catheterized under general anesthesia. Routine antibiotic prophylaxis was given. A 2.5cm sub-umbilical incision was made and the Hasson method was used to enter the abdominal cavity. A diagnostic laparoscopy was performed. It showed a left ovarian cyst suggestive of a benign cyst and its measurements were consistent with the ultrasound findings. There was no ascites. The rest of the pelvis and abdomen appeared normal with no suggestion of ovarian malignancy. The XXS-sized Alexis® wound retractor (Applied Medical, CA, USA) was inserted. A uterine manipulator with Advincola arch was used for uterine manipulation. Next, purse string sutures were applied over the ovary and contents of the cyst were drained in a controlled fashion using a trocar with suction to prevent the spillage of cyst contents. A total of 4L of clear, straw-colored fluid was drained. After completion of drainage, the trocar was removed and closure of the purse string sites with the surface of the ovaries to reinforce them was done. Subsequently, a home-made single-port system comprising the aforementioned Alexis® wound retractor and a 7½ surgical glove was used. The glove was fixed to the outer ring of the wound retractor. Upon making small incisions in the fingertip portions of the glove, two 5-mm trocars and one 12-mm trocar were inserted. In view of her habitus, 45cm long bariatric instruments and a rigid 30-degree, 5mm diameter, 50cm long endoscope were used. We proceeded with a left salpingo-oophorectomy to facilitate visibility followed by total hysterectomy and right salpingo-oophorectomy. After culpotomy was performed, the uterus and ovaries were removed. In order to avoid spillage, a 15mm Inzii retrieval bag (Applied Medical, CA, USA) was introduced through the vagina so the intact left ovary could be placed into the bag and retrieved through the vagina. The specimen was sent for frozen section which confirmed absence of malignancy. An estimated 100ml of blood was lost.

Postoperatively, the patient was monitored in the high dependency unit. The hemoglobin was stable at approximately 10.5. The patient was discharged on postoperative day 3 when she had recovered well and was able to ambulate.

The umbilical wound healed within a week. After 1 month, the vaginal vault was healed completely and a therapeutic dose of warfarin was resumed. The final histology of the left ovarian cyst was a benign ovarian mucinous cystadenoma.

## Discussion

In this case report, we would like to share our experience on how we performed minimally invasive surgery safely in a morbidly obese patient with a large ovarian cyst and multiple co-morbidities involving the cardiovascular and respiratory systems.

With improvements in laparoscopic surgery and laparoscopic expertise, the feasibility of operating on a large ovarian cyst laparoscopically was demonstrated [4]. The main concern of performing such a surgery laparoscopically is the potential risk of a malignant ovarian cyst. According to the literature, the risk of malignancy of ovarian cysts after careful pre-operative assessment could be reduced to 0.2-0.6% [5]. Nevertheless, frozen sections are important to determine the nature of the cyst. Scheib et al. reported 3 benign cysts that turned out to be malignant on frozen section [6]. The other concern is intra-operative spillage of cyst contents into the peritoneal cavity, when malignancy has yet to be excluded. The incidence of tumor spillage in published series of laparoscopically managed large ovarian masses varies between 22-100%, whereas the risk of rupture during laparotomy has been reported to be in the range of 10-26% [5].

In our case, the ovarian cyst has been properly evaluated preoperatively with blood tests (CA 125) and imaging scans (US, CT). Minimally invasive surgery could be considered as the evaluations suggest a benign cyst. When doing so, the potential rupture of the cyst in view of its size should be taken into account.

Intraoperatively, a diagnostic scope can evaluate for any abnormal appearance of the ovarian cyst and peritoneal disease. Controlled drainage is possible if the cyst is confined to the ovary. In our experience, the benefit of single site surgery is the ability to expose the ovary with the Alexis wound retractor using a bigger abdominal incision (2.5-3cm). This facilitates application of purse string sutures to the ovary, insertion of the trocar into the cyst and subsequent decompression of the cyst without spillage. In this procedure, the stability of the cyst is maintained by direct contact between the wound retractor and the cyst. On the other hand, conventional laparoscopy uses grasping forceps to hold onto the cyst [5]. This poses a risk of slippage when the ovarian cyst has a smooth surface. Without adequate stabilisation of the cyst, the potential risk of intra-operative spillage increases.

Another measure to minimise intraoperative spillage is the removal of the specimen through a laparoscopic bag [5]. On top of creating a barrier between the specimen and the peritoneal cavity, additional drainage of the cyst can be performed within the bag when further reduction in the size of the cyst is needed. In our case, after performing a hysterectomy, the bag was introduced through the vagina and the left ovary was retrieved from the vagina with the remaining contents of the cyst drained within the bag to facilitate the retrieval of this ovary.

Laparo-endoscopic surgery was also performed without a significant increase in cost burden to the patient as conventional laparoscopic instruments were used.

In obese patients, LESS has its advantages as minimally invasive surgery improves postoperative recovery compared to open surgery. According to Tyan et al., in comparison to patients with  $18.5 \leq \text{BMI} < 25$  who underwent laparoscopic hysterectomy, thromboembolic events, wound, cardiac and pulmonary complications were 1.14, 1.58, 2.19 and 2.71 times more likely in patients with  $\text{BMI} > 40$  respectively [7]. Such complications can be detrimental to morbidly obese patients who have poorer cardiorespiratory reserves. Using LESS, our patient with a BMI of 46 recovered well postoperatively with no complications.

Indeed, laparoscopic management of morbidly obese patients is known to increase technical difficulties such as harder port entry, poorer visualisation of the pelvis and surgeon fatigue [8].

Other than obesity, cardiovascular and respiratory compromise also deter surgeons from opting for minimally invasive surgery due to its negative cardiorespiratory effects, particularly when a Trendelenburg position is necessary [9]. This position leads to a further decrease in functional residual capacity because of a more pronounced displacement of the diaphragm [10]. These challenges can be overcome by having good case selection, an experienced LESS surgeon and peri-operative optimisation by a multi-disciplinary team. Previously, Fanfani et al. had demonstrated the feasibility of LESS in obese patients, with the highest BMI being 48 in that study [10]. Given the multiple co-morbidities of our patient including heart failure, atrial fibrillation and obstructive sleep apnea, peri-operative optimisation by a multi-disciplinary team was crucial to minimise complications and improve the success of LESS surgery [9].

## Conclusion

Although performing LESS THBSO for a large ovarian cyst in a morbidly obese patient comes with its challenges, it can still be performed safely and effectively given (1) an appropriate case selection, (2) a surgeon experienced in performing LESS surgery and (3) management of the patient in a multi-disciplinary team. Such a method also reduces surgical morbidity and improves postoperative recovery in morbidly obese patients.

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## Authors' contribution

Wei-An Goh: data collection, drafting manuscript

Tan MX Eunice: data collection, drafting manuscript

Ravichandran Nadarajah: conception of report, revision of manuscript

## Disclosure

The authors declare that there is no conflict of interest.

This report is exempt from Institutional Review Board, ethics committee and ethical review board study approval. This report is exempt from institutional animal care and use committee approval. All human subjects provided written informed consent with guarantee of confidentiality.

This manuscript has not been presented or published elsewhere.

## References

- [1] Fatema N, Mubarak Al Badi M. A Postmenopausal Woman with Giant Ovarian Serous Cyst Adenoma: A Case Report with Brief Literature Review. *Case reports in obstetrics and gynecology*. 2018;2018:5478328-4.
- [2] Tagliabue F, Acquaro P, Confalonieri G, Spagnolo S, Romelli A, Costa M. Laparoscopic approach for very large benign ovarian cyst in young woman. *J Minim Access Surg*. 2009;5(3):75-77. doi:10.4103/0972-9941.58502
- [3] Guraslan H, Senturk MB, Dogan K, Guraslan B, Babaoglu B, Yasar L. Total Laparoscopic Hysterectomy

in Obese and Morbidly Obese Women. *Gynecologic and obstetric investigation*. 2015;79:184-188.

- [4] Eltabbakh GH, Charboneau AM, Eltabbakh NG. Laparoscopic surgery for large benign ovarian cysts. *Gynecologic oncology*. 2007;2008;108:72-76.
- [5] Vlahos NF, Iavazzo C, Marcopoulos MC, et al. Laparoscopic Management of Large Ovarian Cysts. *Surgical innovation*. 2012;19:370-374.
- [6] Scheib SA, MD, Fader AN, MD. Gynecologic robotic laparoendoscopic single-site surgery: prospective analysis of feasibility, safety, and technique. *American journal of obstetrics and gynecology*. 2015;212:179.e1-179.e8.
- [7] Tyan P, Amdur R, Berrigan M, et al. Differences in Postoperative Morbidity among Obese Patients Undergoing Abdominal Versus Laparoscopic Hysterectomy for Benign Indications. *J Minim Invasive Gynecol*. 2020;27(2):464-472. doi:10.1016/j.jmig.2019.04.001
- [8] Uccella S, Bonzini M, Palomba S, et al. Impact of Obesity on Surgical Treatment for Endometrial Cancer: A Multicenter Study Comparing Laparoscopy vs Open Surgery, with Propensity-Matched Analysis. *J Minim Invasive Gynecol*. 2016;23(1):53-61. doi:10.1016/j.jmig.2015.08.007
- [9] Atkinson TM, Giraud GD, Togioka BM, Jones DB, Cigarroa JE. Cardiovascular and Ventilatory Consequences of Laparoscopic Surgery. *Circulation*. 2017;135(7):700-710. doi:10.1161/CIRCULATIONAHA.116.023262
- [10] Fanfani F, Boruta DM, Fader AN, et al. Feasibility and surgical outcome in obese versus nonobese patients undergoing laparoendoscopic single-site hysterectomy: a multicenter case-control study. *J Minim Invasive Gynecol*. 2015; 22 (3): 456-461. doi:10.1016/j.jmig.2014.12.008



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