

REVIEW ARTICLE

Safety and outcomes of Laparoscopic management of benign adnexal masses

Amr M. Salheen¹, Mohamed S. Fahmy¹, Ahmed H. Elsayed¹, Hany F. Sallam¹, and Abdou S. Ait-Allah²

¹Department of obstetrics and gynecology, faculty of medicine, Aswan University ¹Department of obstetrics and gynecology, faculty of medicine, Sohag University

Laparoscopic surgery has many advantages, like less tissue dissection, less need of analgesia postoperatively, better Keywords: laparoscopy, adnexa, cosmetic aspect, less intraoperative and postoperative adnexal masses, surgery. complications, and early return to work. Presence of adnexal mass is one of the most common indications for referral to the gynaecologist. Adnexal masses can be discovered accidently in patients being evaluated for a Gynecological complaint or even in asymptomatic patients. An ideal ovarian cystectomy will consist of removal of the cyst intact with limited trauma to residual ovarian tissues. With large cysts, aspiration is *Corresponding author: appropriate to decompress the mass and assist in dissection Amr M. Salheen and excision. If cyst ruptures, the resulting contamination is greater than if the cyst were opened and aspirated. However, Email: amr.mostafa@aswu.edu.eg teratomas should be removed intact whenever possible. Tel::01142264727 Laparoscopic management of dermoid cysts was reported as early as 1987. This review aims to assess the safety and outcomes of laparoscopic management of adnexal masses.

ABSTRACT

INTRODUCTION Adnexal masses:

An adnexal mass, which is a lump located in the ovary, fallopian tube, or adjacent connective tissues, is a commonly encountered gynaecological issue. In the United States, women undergoing surgery for a presumed ovarian tumour face a lifetime risk of 5 to 10 percent. Adnexal masses can take many forms and can arise in females of all ages, from fetal to elderly stages [1].

Adnexal masses can occur in females of all ages, ranging from fetuses to elderly women, and the reported prevalence varies significantly depending on the population being studied and the diagnostic criteria used. For instance, a study of 335 asymptomatic women between the ages of 25 and 40 found that 7.8% had adnexal lesions, with a prevalence of ovarian cysts of 6.6% [2]. In another study involving 8,794 asymptomatic postmenopausal women who underwent transvaginal ultrasonography as part of a regular gynaecological examination, 2.5% had a simple unilocular adnexal cyst [3]. Similar results were obtained in a study of 33,739 women in the Ovarian Cancer Screening Program at the University of Kentucky [4].

Most adnexal masses originate in the ovary. To differentiate between a "extraovarian mass" and a "ovarian mass," a diagnostic for any adnexal mass must differentiate between a "extraovarian mass" and a "ovarian mass." Extraovarian masses consist of tubal pregnancy, tuboovarian abscess,



peritoneal pseudocyst, pedunculated subserous fibroid, diverticulous abscess, appendiceal abscess or tumour, inflammatory or malignant intestinal mass, and pelvic kidney [5].

Ovarian masses consist of functional cyst, endometrioma, theca lutein cyst, original tumour, and metastatic cancer [6].

The assessment of patient with an adnexal mass starts with a comprehensive medical history and physical examination. Imaging, along with laboratory tests, is required usually. Nevertheless, histological investigation is the definitive diagnosis method [7].

To diagnose and differentiate adnexal masses, many imaging modalities are utilized. Among these are ultrasonography, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET). Due its availability, patient acceptability, and cost-effectiveness, transvaginal ultrasonography has become the imaging method of choice **[8]**.

To completely describe masses that may be present in the pelvis or the abdomen, a detailed sonographic evaluation will involve both a transvaginal and a transabdominal approach. The sonographic report should include the dimensions of the mass and consistency, its location (ovary, uterus, bowel), laterality, and the presence or absence of certain features. Any of these factors may help determine an individual's cancer risk. Increasing size across many imaging examinations, septations, mural nodules, papillae, solid components, and the presence of ascites are often linked with a greater risk of malignancy [9].

Colour Doppler ultrasonography and three-dimensional ultrasonography with "vascular sampling" of questionable regions have also been studied, although further research is necessary to determine their efficacy. There have been created scoring algorithms to evaluate the chance of malignancy [10].

In smaller investigations, typical characteristics of benign adnexal masses have been reported. Endometriomas will consist of a spherical, fluid- filled, homogenous mass with low-level echoes [11]. Teratomas that have reached maturity will comprise hypoechoic components and numerous tiny homogenous interfaces [12].

No medical body presently recommends routine screening for ovarian cancer. Nonetheless, investigations on a broad scale have proved the feasibility and usefulness of multimodal screening procedures [13].

Laparoscopy:

Laparoscopic surgery is used for many interventions that were conventionally performed by laparotomy. Conventional and robotic approaches are used [14]. Possible benefits of laparoscopy over laparotomy include a shorter operational time, smaller scars, quicker recovery, less adhesion development, and a lower cost [15].

In a meta-analysis of 27 randomised studies comparing laparoscopy versus laparotomy for benign gynecologic diseases, the risk of mild sequelae (e.g., fever, wound or urinary tract infection) was reduced in women having laparoscopic operations (RR 0.55, 95% CI 0.45 to 0.66). Comparatively, the risk of significant complications, as pulmonary embolism, fistula development, and major extra unexpected surgery, was the same for both groups [16]. Umbilical access

Commonly, gynecologic laparoscopic entrance is through or at the umbilicus. Initial entrance is also possible via various places on the abdominal wall, the vagina, or the uterus. When umbilical entrance is unsafe or difficult, it is vital to seek other access locations [17].

The conventional method for laparoscopic entrance is to blindly put a sharp Veress needle into the umbilicus, insufflate, and then permit a sharp trocar. Veress entry techniques and other direct



entrance procedures, such as open access (Hasson) or radially expanding trocars, are covered in depth elsewhere **[18]**.

There is no evidence that one umbilical entrance technique is preferable than another, according to two systematic reviews. The optimal determinant of strategy selection is the clinical context and surgeon's skill set. Those who are likely to have adhesions, for instance, may benefit from an open approach because any harm is more likely to be discovered [19].

Trocar placement

Port placement for multi-port laparoscopic hysterectomy normally consists of a primary port at the umbilicus and two auxiliary ports in the bilateral lower quadrants [20]. To avoid injury to nerves or blood vessels in the abdominal wall, the lower quadrant ports are positioned approximately 2 cm medial and 2 cm caudal to the anterior superior iliac spine, lateral to the rectus border [21].

A fourth port may be advantageous, especially in situations needing wide-ranging dissection or suturing, and can be positioned supra-pubically or in the lateral abdominal wall at the umbilical level. In cases with larger uteri in which the fundus approaches the umbilicus, it may be required to position the ports higher on the abdominal wall to allow adequate space for visualisation and instrument manipulation [21].

Surgical therapy for benign adnexal lesions:

Ovarian Cysts

The primary advantage of the laparoscopic method in the care of any adnexal mass, especially for benign ones, is the escaping of overtreatment and needless laparotomy **[22]**

The surgical treatment plan for a cyst that seems benign must include cytological evaluation of pelvic washings and frozen section. Aspiration of a cyst alone is not indicated. The pathologic analysis of cyst fluid is insufficient for diagnosing cancer. Moreover, recurrence of cysts is typical following simple aspiration [22].

A perfect ovarian cystectomy will involve removal of the intact cyst with little harm to remaining ovarian tissues **[23]**. Techniques for aspirating bigger cysts have been discussed earlier. Nonetheless, entire teratomas should be removed whenever feasible. Nezhat et al. described video laparoscopic therapy of dermoid cysts as early as 1987 **[23]**.

For prevention of recurrence, it is important to remove the cyst wall. If the cyst wall cannot be detected, the ovarian incision can be "freshened" to expose a clean edge and facilitate dissection. The atraumatic formation of the proper plane between the wall and ovarian tissues is essential for the full excision of a cyst and its wall. This may be achieved more readily using hydro dissection [17].

Tissues that have been excised should be removed using a specimen removal bag. Previously documented removal aids included additional cyst aspiration, morcellation, and reduction of the pneumoperitoneum. The surgeon must verify removal of all tissue [24].

Endometriomas

. Endometriosis frequently causes pelvic discomfort and/or infertility. Approximately 50 % of endometriosis cases involve one or both ovaries, the most frequently affected location. Endometriomas are cysts on or inside the ovarian parenchyma that contain a fluid that resembles chocolate [23].



The appropriate surgical treatment for endometriomas has been the topic of much controversy. There have been claims that both excision and drainage with ablation are better. Recent research supporting excision, however, have proven convincing. A Cochrane study indicated that excision was superior in lowering discomfort, limiting cyst recurrence, and enhancing spontaneous pregnancy in previously infertile women [25]. A randomised controlled experiment demonstrated that ablation causes cyst recurrence to occur sooner and more frequently. To establish the appropriate technique in the context of infertility, ovarian reserve, and future infertility therapies, further research is required.

Classifications of surgical complications

Surgical problems can be categorised based on [26]:

- Severity ranges from "mild/minor" to "severe/major" to "fatal"
- Time: pre-, intra-, early, or late postoperative.
- Surgery stage: laparoscopic entrance, primary phase of surgery, and exiting the abdominal cavity; wounded organs, such as vascular, intestinal, or neurological injuries.
- Instrument-related, pneumoperitoneum-related, surgeon-related, etc.; causation.

Classifications based on severity, complexity, and occurrence time The intensity is frequently the first and primary factor used to classify surgical adverse events (AEs). Sadly, the reporting of adverse events in surgical research is frequently inadequate. For example, intraoperative and postoperative complications are specified in few trials, and classification algorithms are employed in only 9% and 54% of intraoperative and postoperative adverse events, respectively [27].

REFERENCES:

- 1. Wolfman, W., Thurston, J., Yeung, G., et al. 2020. Guideline No. 404: Initial Investigation and Management of Benign Ovarian Masses. *J Obstet Gynaecol Can*, 42, 1040-1050.e1.
- 2. Pavlik, E. J., Ueland, F. R., Miller, R. W., et al. 2013. Frequency and disposition of ovarian abnormalities followed with serial transvaginal ultrasonography. *Obstet Gynecol*, 122, 210-217.
- **3.** Castillo, G., Alcázar, J. L. & Jurado, M. 2004. Natural history of sonographically detected simple unilocular adnexal cysts in asymptomatic postmenopausal women. *Gynecol Oncol*, 92, 965-9.
- 4. Timmerman, D., Van Calster, B., Testa, A., et al. 2016. Predicting the risk of malignancy in adnexal masses based on the Simple Rules from the International Ovarian Tumor Analysis group. *Am J Obstet Gynecol*, 214, 424-437.
- 5. Biggs, W. S. & Marks, S. T. 2016. Diagnosis and Management of Adnexal Masses. Am Fam Physician, 93, 676-81.
- 6. Nezhat, C., King, L. P., Cho, J., et al. 2021. Video Laparoscopic Management of Adnexal Masses With or Without Robotic Assistance. *Robotic Surgery*, 1259-1266.
- 7. Yoon, J. Y. & Cheon, C. K. 2019. Evaluation and management of amenorrhea related to congenital sex hormonal disorders. *Annals of Pediatric Endocrinology & Metabolism*, 24, 149.
- 8. Brito, M. E., Borges, A., Rodrigues, S., et al. 2021. Conservative Management of Asymptomatic Adnexal Masses Classified as Benign by the IOTA ADNEX Model: A Prospective Multicenter Portuguese Study. *Diagnostics (Basel)*, 11.
- 9. Mcdonald, J. M., Doran, S., Desimone, C. P., et al. 2010. Predicting risk of malignancy in adnexal masses. *Obstet Gynecol*, 115, 687-694.
- 10. Lee, S. J., Oh, H. R., Na, S., Et al. 2022. Ultrasonographic ovarian mass scoring system for predicting malignancy in pregnant women with ovarian mass. *Obstet Gynecol Sci*, 65, 1-13.



- **11. Rolla, E. 2019.** Endometriosis: advances and controversies in classification, pathogenesis, diagnosis, and treatment. *F1000Res*, 8.
- **12. Sofic, A., Husic-Selimovic, A., Katica, V., et al. 2018.** Magnetic Resonance Imaging (MRI) and Transvaginal Ultrasonography (TVU) at Ovarian Pain Caused by Benign Ovarian Lesions. *Acta Inform Med*, 26, 15-18.
- **13. Menon, U., Mcguire, A. J., Raikou, M., et al. 2017.** The cost- effectiveness of screening for ovarian cancer: results from the UK Collaborative Trial of Ovarian Cancer Screening (UKCTOCS). *Br J Cancer*, 117, 619-627.
- 14. Noor, N., Das, A., Roy, K. K., et al. 2021. Extraperitoneal Laparoscopy in Severe Intra-abdominal Adhesions: A Safe Alternative to Laparotomy. *Gynecology and Minimally Invasive Therapy*, 10, 181.
- **15. Aarts, J. W., Nieboer, T. E., Johnson, N., et al. 2015.** Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database Syst Rev*, 2015, Cd003677.
- 16. Oti, C., Mahendran, M. & Sabir, N. 2016. Anaesthesia for laparoscopic surgery. Br J Hosp Med (Lond), 77, 24-8.
- 17. Cezar, C., Becker, S., Di Spiezio Sardo, A., et al. 2017. Laparoscopy or laparotomy as the way of entrance in myoma enucleation. *Arch Gynecol Obstet*, 296, 709-720.
- **18. Varma, R. & Gupta, J. K. 2008.** Laparoscopic entry techniques: clinical guideline, national survey, and medicolegal ramifications. *Surg Endosc*, 22, 2686-97.
- 19. Cuss, A., Bhatt, M. & Abbott, J. 2015. Coming to terms with the fact that the evidence for laparoscopic entry is as good as it gets. *J Minim Invasive Gynecol*, 22, 332-41
- 20. Sharp, H. T. 2019. Overview of gynecologic laparoscopic surgery and non-umbilical entry sites. *UpToDate*, 10.
- 21. Alkatout, I., Mettler, L., Maass, N., et al. 2015. Abdominal anatomy in the context of port placement and trocars. *J Turk Ger Gynecol Assoc*, 16, 241-51.
- 22. Talwar, P., Talwar, K. & Pranidha, S. C. 2019. Large adnexal mass: is laparoscopic surgery a safe option? *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 8, 1431-1436.
- 23. Nezhat, F. R., Pejovic, T., Reis, F. M., et al. 2014. The link between endometriosis and ovarian cancer: clinical implications. *Int J Gynecol Cancer*, 24, 623-8.
- 24. Detorakis, S., Vlachos, D., Athanasiou, S., et al. 2016. Laparoscopic cystectomy in-a-bag of an intact cyst: is it feasible and spillage-free after all? *Minimally Invasive Surgery*, 2016.
- 25. Falcone, T. & Wilson, J. R. 2019. Surgical treatment of endometriosis: excision versus ablation of peritoneal disease. *Journal of Minimally Invasive Gynecology*, 26, 1-2.
- 26. King, N. R., Lin, E., Yeh, C., et al. 2021. Laparoscopic Major Vascular Injuries in Gynecologic Surgery for Benign Indications: A Systematic Review. *Obstet Gynecol*, 137, 434-442.
- 27. Rosenthal, R., Hoffmann, H., Dwan, K., et al. 2015. Reporting of adverse events in surgical trials: critical appraisal of current practice. *World J Surg*, 39, 80-7.