Minimally invasive surgery

A Guide for Gynaecological Cancer Patients

ENGAGe

ESGO | European Network of Gynaecological Cancer Advocacy Groups

Contents

We all know the impact of receiving a gynaecological cancer diagnosis is very harsh. As patients, we are in shock and, many times we cannot even ask the simplest questions.

We hear of different approaches,
and we do not know which one will be the most suitable for our personal case.

During gynaecological cancer treatment, surgery often becomes inevitable.
This can be a very stressful moment in the patient's journey with cancer,
when information and reassurance are needed.

Technological advancement in surgery in the past years has opened new possibilities available to a wider audience.

The aim of this brochure is to explain different surgical approaches and to help patients prepare for what they may encounter in the pre- and post-operative period.

Different types of surgery available for cancer patients

In gynaecological cancer cases, surgery often represents the mainstay of treatment together with medical treatment, either chemotherapy or radiotherapy, whenever needed.

Overall, the choice of surgical approach has to be tailored in relation to cancer type and disease distribution.

There are different surgery types:

- **1. Open surgery** – the surgeon makes an incision in the abdomen large enough to perform the procedure using hand-held tools.
- **2. Laparoscopic surgery** – the surgeon makes a few small incisions in the abdomen and operates using special long-handled tools/laparoscopic surgical instruments while viewing magnified images from the laparoscope (camera) on a video screen.
- **3. Robotic-assisted laparoscopic surgery** – the laparoscopic surgical instruments are attached to robotic arms which the surgeon controls via a robotic system to perform the procedure.

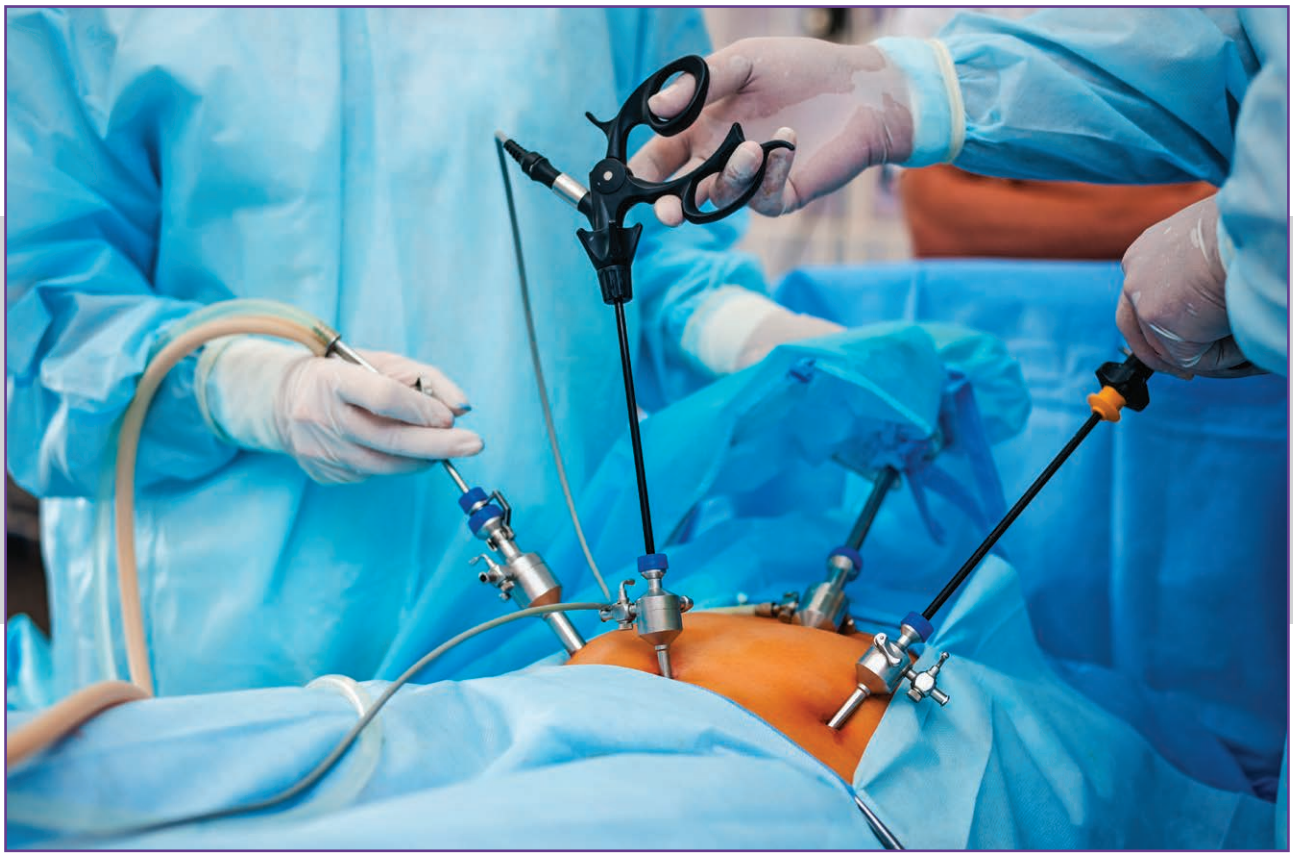
Minimally invasive surgery (MIS)

MIS is an alternative to traditional open surgery for gynaecological cancer. Both conventional laparoscopic and robotic-assisted laparoscopic surgeries are considered to be minimally invasive. MIS allows the surgeon to perform surgery using several small incisions (0.5–2cm) compared to one large abdominal incision called laparotomy. In MIS, dedicated surgical instruments are put through the small incisions in the abdomen and handled by the surgeons from the outside.

Both laparoscopic and robotic-assisted laparoscopic surgery are considered to be minimally invasive surgical approaches because they are both performed with a similar technique with a few differences, mainly in relation to the placement of surgical access and the surgeon's position.

Laparoscopic surgery is usually performed via three key-hole accesses generally placed in the lower part of the abdomen plus one slightly bigger key-hole access in the belly button. The primary surgeon stands by the operating table and surgery is performed with two additional assistants.

A similar approach is performed in case of **robotic-assisted laparoscopic surgery**, which also uses three to four key-hole plus the key-hole for camera placement (slightly bigger than laparoscopic port sites), which can be placed in various sites depending on the selected robotic system. In contrast to standard laparoscopic surgery, the primary surgeon is sitting on the main console of the device, which is located inside the operating room, while the first and second assistances stand by the operating table.



Laparoscopic surgery

Robotic-assisted laparoscopic surgery

Benefits of MIS

Bearing in mind that oncological safety remains the priority of gynaecological oncology surgery and that the choice of surgical approach is made in relation to what we need to treat, the benefit of MIS (either laparoscopy or robotic-assisted laparoscopy) has been widely demonstrated in medical literature. Indeed, it is well established that a minimally invasive approach is able **to positively impact on patient recovery**[1)] because it has several advantages, which include smaller incisions, shorter hospital stays, quicker recovery, improved visualisation due to image magnification, less need for postoperative analgesics, and a lower risk of complications (such as blood loss, wound infection or herniation[2,3)]. These characteristics are particularly important in the setting of oncology where a shorter recovery period may facilitate a shorter interval to postoperative treatments such as chemotherapy or radiation[4)].

Robotic-assisted laparoscopic procedures have several advantages: binocular vision and 3-dimensional views permit improved depth perception which may facilitate advanced laparoscopic procedures. The console is located away from the patient and permits the surgeon to operate in a comfortable, seated position, thus making operator positioning more ergonomic and less tiring for the surgeon. Also, the surgeon's learning curve is shorter compared to traditional laparoscopy[5)].

Overall, positive outcomes on safety (both oncological and in relation to complication rate) of minimally invasive surgery in gynaecological oncology have been widely demonstrated, so that the **use of a minimally invasive surgical approach is recommended by international guidelines[6,7)] in selected treatment settings, in relation to cancer type and disease stage.**

Limitations of MIS

Laparoscopy has its limitations mainly related to a longer learning curve for the surgical equipment, and limited-depth perception since imaging is limited to mostly 2-dimensional views[4)]. In selected equipment 3-dimensional is nowadays available too. In order to overcome those limitations, multiple innovations have been introduced in the last decades, ranging from better laparoscopic instrumentation to robotic-assisted surgery, which represents a technological advancement derived from conventional laparoscopy able to facilitate the application of minimally invasive techniques for complex operations, such as in obese/overweight patients[8)].

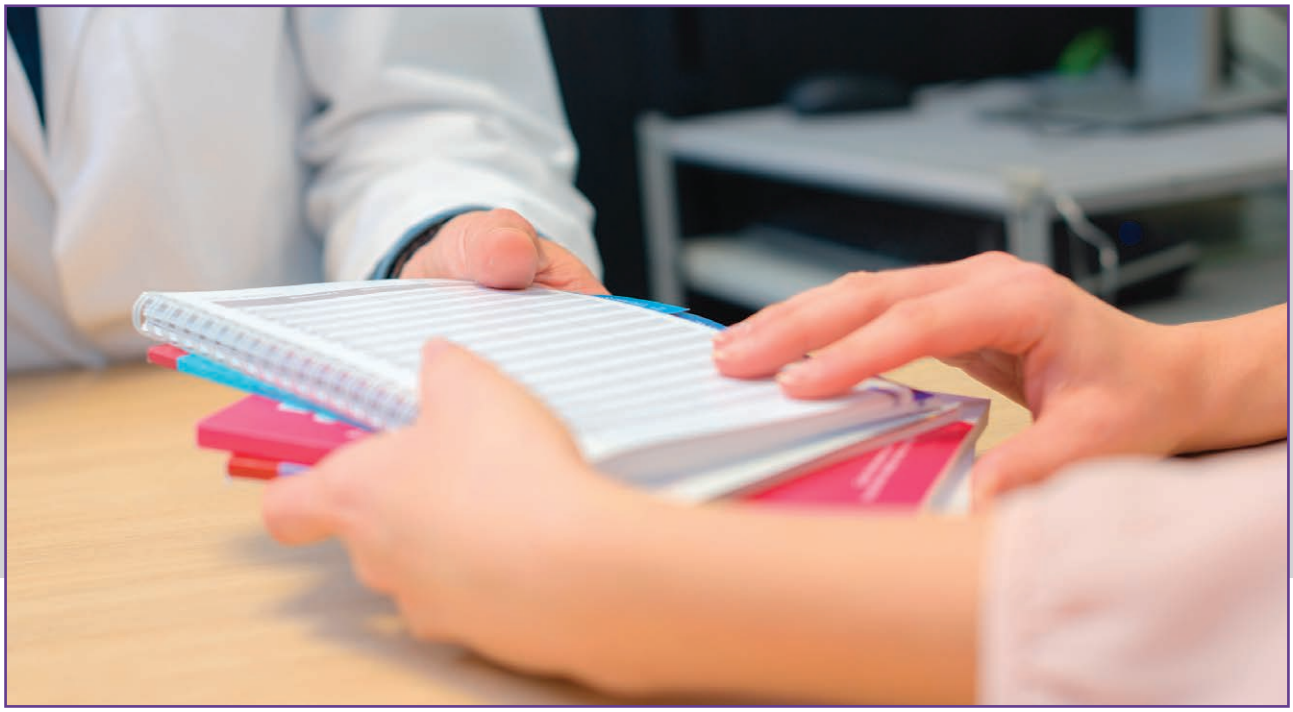
Disadvantages can be summarised as increased costs of robotic equipment, and reduction of tactile perception from the operating surgeon, and slightly bigger port access (which can impact on final aesthetic results)[4)].

MIS in gynaecological cancers

In gynaecological oncology surgery, the choice of surgical approach has to be tailored in relation to cancer histology and the extension of the disease. Specifically, as per ESGO guidelines[6], presumed **early-stage uterine and ovarian cancers** (when the disease is confined to the ovaries or uterus without any evidence of intra-abdominal spreading) **can be treated with MIS**, as it has been demonstrated not to negatively impact on oncological outcomes. On the contrary, if the disease appears to have spread outside the site of origin, surgery is generally performed through a laparotomy (midline abdominal incision), since it better enables surgeons to remove all visible disease, which is the primary aim of surgical procedures. In advanced ovarian cancer cases, the role of MIS is crucial in order to select a treatment pathway, due to the fact that in many centres a diagnostic laparoscopy[9] is performed either as a separate procedure or at the beginning of surgery in order to assess disease distribution and decide if primary surgery (via laparotomy) is an option or patient's is best treated with neo-adjuvant chemotherapy.

In cervical cancer cases amenable to surgical treatment (locally advanced disease), in light of recent publications regarding the association between surgical approach and patient outcomes, the **role of MIS is still a matter of debate**[10]. Indeed, as per international guidelines[11], despite laparotomy being the standard approach, MIS may be considered only in the so called low-risk tumours (small and completely excised after conisation), in high-volume centres experienced in performing radical hysterectomy with minimally invasive surgery, and only if the patient agrees after having a comprehensive discussion with the doctor about the current evidence.

Generally, the primary surgeon is responsible for having a discussion with you and selecting a treatment strategy, which includes the choice of surgical approach (either MIS or laparotomy) and surgical procedures. The discussion should take into account both the extent of the disease and available literature on the association of MIS and oncologic outcomes for your specific case.



How to prepare for surgery

Preoperative preparation to surgery, sometimes referred to as **pre-habilitation**, is generally planned in order to decrease stress and improve the patient's quality of life. This helps the body heal faster after the procedure. Overall, despite some grade of variability among hospital policies, patient education is a deciding factor for this process. Stopping smoking is advised, since that can cause impaired wound healing and pulmonary complications. Ultimately, optimisation of pre-existing medical comorbidities such as hypertension and diabetes should also be prioritised together with improving nutrition, which is also associated with better post-operative outcomes[12)].

Patients will be asked to fast from solids, usually from midnight of the day before the operation. Patients are allowed to bring someone to help them at hospital admission; and, depending on hospital policies, also a chaperone during the post-operative inpatient stay. All policies can be discussed with the medical and nursing staff at the time of admission.

Some patients share their positive experience with pre-habilitation, such as optimising their physical and mental health through needs-based prescribing of exercise, nutrition, and psychological interventions. From their personal experiences, this preparation was useful psychologically as a plan they aspired to, kept their minds busy with something else than worrying about surgery, and formed a goal for them to work toward after surgery. For some patients, this even created positive habits they kept long after rehabilitation after surgery.

Rehabilitation after surgery

Studies have shown that minimally invasive surgery reduces the length of post-operative inpatient stay and allows for faster recovery[13]. Most patients can be discharged home the same day or a day after their surgical procedure. In the early post-operative period and in line with Enhanced Recovery After Surgery Protocol (ERAS), oral feeding will have to be restored as soon as possible together with an early removal of intravenous access and the urinary catheter. Early mobilisation of patients appears to be of the utmost importance in order to provide a quicker and faster recovery and reduce recovery time and length of hospital stay. It also helps to prevent or decrease the risk or severity of several postoperative complications such as pulmonary infections, venous thromboembolic events, ileus, and muscle atrophy. In the absence of risk factors such as reduced mobility, obesity, and previous thromboembolic events, extended thromboprophylaxis to reduce blood clotting is usually not recommended in cases of minimally invasive surgery.

The primary aim of an enhanced recovery program is to ultimately guarantee an early discharge, which will have to include adequate information on variation in bowel movements and postoperative diet recommendation, information about further treatments/outpatient appointments, and the need for a designated contact to address patients' concerns after discharge.

PATIENT PERSPECTIVE

„Rehabilitation was crucial for me when undergoing minimally invasive surgery for gynaecological oncology. Key tips I would give include early mobility, pelvic floor exercises, deep breathing and coughing exercises, effective pain management, proper nutrition, emotional support, gradual return to activities, regular follow-up care, and considering specialised rehabilitation programs.

These strategies support recovery, prevent complications, enhance physical function, promote emotional well-being, and ensure optimal healing for patients in their post-operative journey."

Conclusions

In gynaecological oncology, the minimally invasive surgical approach represents a valid and safe alternative to laparotomy in selected cancer types and disease stages. Where available literature data provide an adequate background on safety and oncologic outcomes, the minimally invasive surgical approach, either conventional laparoscopy or robotic-assisted laparoscopic surgery, may be offered to patients in relation to the demonstrated faster recovery and less post-operative complications.

Results of ongoing trials are awaited to potentially further expand the role of MIS in gynaecological cancers.

References

1. *Velanovich V. Laparoscopic vs open surgery: a preliminary comparison of quality-of-life outcomes. Surg Endosc. 2000 Jan;14(1):16-21. doi: 10.1007/s004649900003. PMID: 10653229.*

2. *Agha R, Muir G. Does laparoscopic surgery spell the end of the open surgeon? J R Soc Med. 2003 Nov;96(11):544-6. doi: 10.1177/014107680309601107. PMID: 14594961; PMCID: PMC539626.*

3. *Nanavati AJ, Nagral S. Why have we embraced minimally invasive surgery and ignored enhanced recovery after surgery? J Minim Access Surg. 2016 Jul-Sep;12(3):299-301. doi: 10.4103/0972-9941.181392. PMID: 27279409; PMCID: PMC4916764.*

4. *Leitao MM Jr, Kreaden US, Laudone V, Park BJ, Pappou EP, Davis JW, Rice DC, Chang GJ, Rossi EC, Hebert AE, Slee A, Gonen M. The RECOURSE Study: Long-term Oncologic Outcomes Associated With Robotically Assisted Minimally Invasive Procedures for Endometrial, Cervical, Colorectal, Lung, or Prostate Cancer: A Systematic Review and Meta-analysis. Ann Surg. 2023 Mar 1;277(3):387-396. doi: 10.1097/SLA.0000000000005698. Epub 2022 Sep 8. PMID: 36073772; PMCID: PMC9905254.*

5. *Nezhat F. Minimally invasive surgery in gynecologic oncology: laparoscopy versus robotics. Gynecol Oncol. 2008 Nov;111 (2 Suppl):S29-32.*

6. *Colombo N, Sessa C, du Bois A, Ledermann J, McCluggage WG, McNeish I, Morice P, Pignata S, Ray-Coquard I, Vergote I, Baert T, Belaroussi I, Dashora A, Olbrecht S, Planchamp F, Querleu D; ESMO-ESGO Ovarian Cancer Consensus Conference Working Group. ESMO-ESGO consensus conference recommendations on ovarian cancer: pathology and molecular biology, early and advanced stages, borderline tumours and recurrent disease†. Ann Oncol. 2019 May 1;30(5):672-705. doi: 10.1093/annonc/mdz062. PMID: 31046081.*

7. *Concin N, Matias-Guiu X, Vergote I, Cibula D, Mirza MR, Marnitz S, Ledermann J, Bosse T, Chargari C, Fagotti A, Fotopoulou C, Gonzalez Martin A, Lax S, Lorusso D, Marth C, Morice P, Nout RA, O'Donnell D, Querleu D, Raspollini MR, Sehouli J, Sturdza A, Taylor A, Westermann A, Wimberger P, Colombo N, Planchamp F, Creutzberg CL. ESGO/ESTRO/ESP guidelines for the management of patients with endometrial carcinoma. Int J Gynecol Cancer. 2021 Jan;31(1):12-39. doi: 10.1136/ijgc-2020-002230. Epub 2020 Dec 18. PMID: 33397713.*

8. *Cusimano MC, Simpson AN, Dossa F, Liani V, Kaur Y, Acuna SA, Robertson D, Satkunaratnam A, Bernardini MQ, Ferguson SE, Baxter NN. Laparoscopic and robotic hysterectomy in endometrial cancer patients with obesity: a systematic review and meta-analysis of conversions and complications. Am J Obstet Gynecol. 2019 Nov;221(5):410-428.e19. doi: 10.1016/j.ajog.2019.05.004. Epub 2019 May 10. PMID: 31082383.*

9. *Fagotti A, Ferrandina G, Fanfani F, Ercoli A, Lorusso D, Rossi M, Scambia G. A laparoscopy-based score to predict surgical outcome in patients with advanced ovarian carcinoma: a pilot study. Ann Surg Oncol. 2006 Aug;13(8):1156-61. doi: 10.1245/ASO.2006.08.021. Epub 2006 Jun 21. PMID: 16791447.*

10. *Ramirez PT, Frumovitz M, Pareja R, Lopez A, Vieira M, Ribeiro R, Buda A, Yan X, Shuzhong Y, Chetty N, Isla D, Tamura M, Zhu T, Robledo KP, Gebski V, Asher R, Behan V, Nicklin JL, Coleman RL, Obermair A. Minimally Invasive versus Abdominal Radical Hysterectomy for Cervical Cancer. N Engl J Med. 2018 Nov 15;379(20):1895-1904. doi: 10.1056/NEJMoa1806395. Epub 2018 Oct 31. PMID: 30380365.*

11. *Cibula D, Raspollini MR, Planchamp F, Centeno C, Chargari C, Felix A, Fischerová D, Jahnn-Kuch D, Joly F, Kohler C, Lax S, Lorusso D, Mahantshetty U, Mathevet P, Naik R, Nout RA, Oaknin A, Peccatori F, Persson J, Querleu D, Bernabé SR, Schmid MP, Stepanyan A, Svintsitskyi V, Tamussino K, Zapardiel I, Lindegaard J. ESGO/ESTRO/ESP Guidelines for the management of patients with cervical cancer - Update 2023. Int J Gynecol Cancer. 2023 May 1;33(5):649-666. doi: 10.1136/ijgc-2023-004429. PMID: 37127326; PMCID: PMC10176411.*

12. *Barber EL, Van Le L. Enhanced Recovery Pathways in Gynecology and Gynecologic Oncology. Obstet Gynecol Surv. 2015 Dec;70(12):780-92. doi: 10.1097/OGX.0000000000000259. PMID: 26676149; PMCID: PMC4683417.*

13. *Bogani G, Sarpietro G, Ferrandina G, Gallotta V, DI Donato V, Ditto A, Pinelli C, Casarin J, Ghezzi F, Scambia G, Raspagliesi F. Enhanced recovery after surgery (ERAS) in gynecology oncology. Eur J Surg Oncol. 2021 May;47(5):952-959. doi: 10.1016/j.ejso.2020.10.030. Epub 2020 Oct 28. PMID: 33139130.*

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ENGAGe recommends contacting your local patient association!

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