

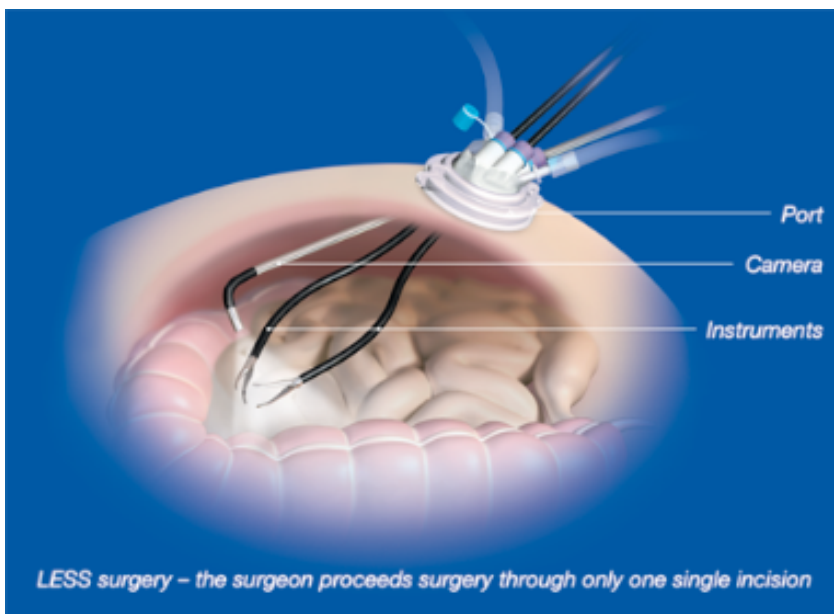
FACT SHEET

LESS – Laparo-Endoscopic Single-Site – Surgery

Minimally invasive procedures have dramatically changed the face of surgery in recent years. By offering safer and gentler surgery to the patient, laparoscopy has the potential to become the gold standard for many interventions. Today, multiple-site laparoscopic surgery has been further developed from multiple-site to single-site surgery.

THE APPROACH: Single access site

LESS surgery is an advanced, minimally invasive surgical technique by which an endoscope and hand instruments are inserted through an access port anchored in just one small incision. Because the incision is usually made in the navel the scar is invisible.



POTENTIAL BENEFITS: One entry into the abdomen was already installed by nature

By reducing the number of incisions in the abdominal wall and confining the incision to the navel, any surgical intervention can result in less trauma to the patient, fewer complications and a far better cosmetic result by minimising or limiting injuries to internal organs, bleeding, infection and post-operative pain. These potential advantages may add up to a faster recovery. Additional studies are essential to further support patient benefits, such as a shorter healing phase and less pain, in addition to improved cosmesis. Olympus is partnering with clinicians in evaluating this new technique. Hospitals are also anticipating the advantages. A gentler, less traumatic procedure not only lowers the risk of post-operative wound complications, but could also potentially reduce the use of pain medication and shorten hospital stays.

PROCEDURES: New perspectives for a growing field of applications

LESS applications range from laparoscopic procedures in general surgery to urological and gynaecological applications.

General Surgery

In general surgery, the first reports on *LESS* gall bladder operations (cholecystectomies) date back as far as 1997. Today, gall bladder removal (cholecystectomy) is the most frequent *LESS* surgery procedure. The *LESS* technique has been applied in addition to a large number of gastrointestinal procedures, including blind gut (appendectomy), colonic resection, spleen (splenectomy) and hernial repair surgeries.

Urology

Within urology, laparoscopic experts have already gained extensive experience with *LESS* surgery. The first keyhole nephrectomy performed through a single site was registered in the year 2007. Different, both

benign and malignant, procedures are being performed. Further surgeries include renal (nephrectomy), adrenal gland (adrenalectomy), pyeloplasty, prostate surgery (prostatectomy) and bladder cancer surgery.

Gynaecology

Within gynaecology, single-port surgeries of the uterus (hysterectomy) and ovary (oophorectomy) are novel fields of application. The application range currently extends to procedures for benign ovarian diseases like ovarian cyst enucleations and adnexectomies. More complex procedures such as large intestine (colectomy) surgery and rectal resections are currently being explored.

HISTORY: From open to *LESS* surgery

The entire history of surgery has always been determined by the idea of reducing the invasiveness and morbidity of surgery, and also by the promise of no scars. But, for a long time, surgical procedures were performed as open surgeries using long incisions. Therefore, surgery was associated with pain, longer recovery times and quite large enduring scars. Over the past 25 years, these conditions have improved significantly – especially due to evolving new techniques.

A landmark achievement was laparoscopy in the 1980s – a minimally invasive surgical (MIS) procedure. In laparoscopy, the surgeon uses special long and thin surgical instruments inserted through three to five small incisions (0.5 cm to 1.5 cm in size) during the laparoscopic intervention.

Compared to traditional open surgery using long incisions, laparoscopy reduces the size of the entry sites. This way, laparoscopic surgery produces the same surgical result as open surgery while improving post-surgical comfort including reduced pain, decreased risk of infections and wound complications, shorter hospital stays, faster recovery and

return to daily routines. Last but not least, laparoscopy achieves a better cosmetic result: compared to open surgery, only small scars are left behind. Since its introduction, laparoscopy has established itself in hospitals as a standard procedure and is performed routinely.

Since the establishment of laparoscopy, the development in MIS has been constantly evolving. Laparo-Endoscopic Single-Site surgery – abbreviated as *LESS* – is a promising next-generation technology in the field of minimally invasive surgery.

LESS EQUIPMENT: Unique design for visualisation and treatment

Together with surgeons, Olympus is fostering the *LESS* approach as an innovative emerging technology. As a result, the set of tools is available to the surgeons from a single source – Olympus: visualise and treat with optics, ports and hand instruments made by a competent partner! To meet the requirements of the surgeons, *LESS* instruments from Olympus have an optimised design, work reliably, are simple to use and easy to handle.

Access Ports

The TriPort is the first multi-instrument port that is specifically designed for *LESS* surgery. Allowing three instruments to be passed into the abdomen simultaneously through one small 12-mm to 25-mm incision usually made in the navel, the TriPort replaces multiple conventional trocars. In combination with dedicated hand instruments and optics, it provides the surgeon with excellent flexibility and superior surgical precision during laparoscopic procedures.

The TriPort consists of a boot containing one 12-mm and two 5-mm gel valves through which the optics and hand instruments are introduced. Additionally, the TriPort has two Luer connectors for insufflation and smoke or vapour evacuation. Except for its larger diameter, the QuadPort is designed according to the same functional principle as the TriPort.

Thanks to its additional access port, the QuadPort can be used for complex procedures requiring the insertion of four instruments simultaneously. It can be used for incision lengths between 25 mm and 60 mm. The larger diameter makes it more suitable for the removal of organs or larger specimens. There are four gel valves, one 5-mm valve, two 10-mm valves and a 15-mm valve.

Hand instruments: HiQ LS

HiQ LS hand instruments are specially designed for *LESS* surgery. They combine the proven high-quality features of previous Olympus instruments with new properties that qualify them specifically for single-site procedures. The proximal end of each hand instrument curves 30° from the axis of the shaft. This feature reduces instruments colliding in the surgeon's working area. Each HiQ LS hand instrument features an S-curved shaft at the distal end designed for triangulation. This allows the surgeon a clear view of the jaws, enabling movements to be executed precisely and in a controlled manner. Adaptations in design and function compensate successfully for the restrictions caused by limited working space. The HiQ LS product line features a wide range of fully autoclavable, reusable 5-mm hand instruments that enable surgeons to perform complex *LESS* procedures with ease and precision.

Imaging: EndoEYE

LESS surgery can be performed using conventional 5- or 10-mm-diameter optics. The orientation and optical views during the *LESS* procedure are different and unfamiliar given the new way of access. To solve this problem, Olympus offers several optical solutions. The Olympus EndoEYE is particularly suitable for *LESS* surgery. This mini camera is available in 5- and 10-mm-diameter versions with 0°, 30° or 45° directions of view.

Cameras with a deflectable tip or a deflectable handle have been developed to improve the ergonomics of *LESS* procedures. A significant benefit of the EndoEYE product range is its space-saving, all-in-one design. Whilst other optics have external, bulky ends on their camera heads and light guide cables that often hinder the surgeon in his movements,

the in-line cable of EndoEYE forms a straight line with the instrument and thus does not require much space to manoeuvre.

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