# PRACTICAL MANUAL FOR
# LAPAROSCOPIC & HYSTEROSCOPIC GYNECOLOGICAL SURGERY

***Kiel School of Gynaecological Endoscopy***

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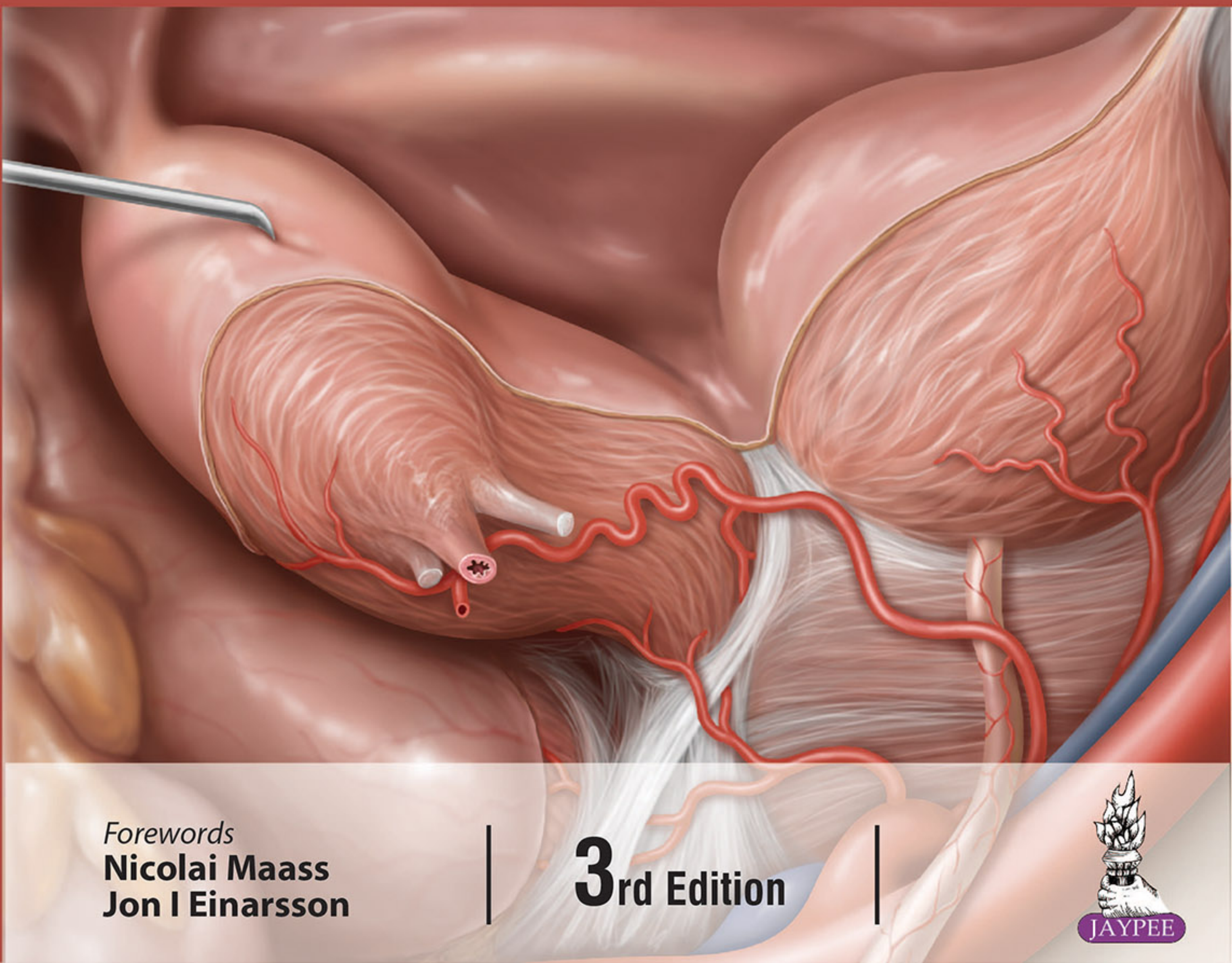

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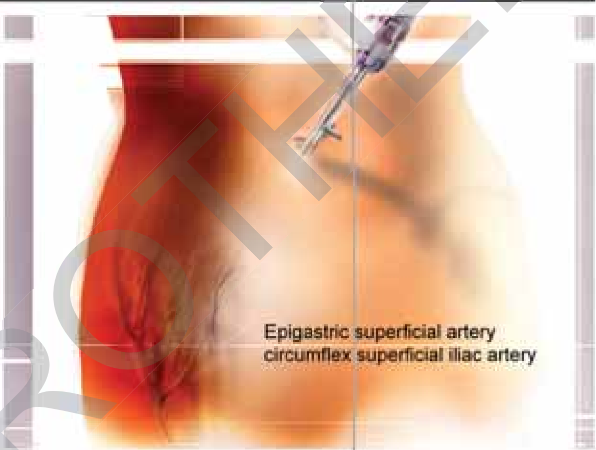



Chapter 4

# Practical Approach to Instrumentation

*Ibrahim Alkatout, Liselotte Mettler*

## INTRODUCTION

Minimally invasive surgery has been undergoing a process of consistent and dynamic evolution due to ongoing scientific and industrial improvements. The minimally invasive approach has transformed surgery altogether.[1] The advantages of minimally invasive surgery compared to open surgery as well as vaginal surgery are well-known and widely accepted in our specialty (Table 4.1).[2-4]

Technical advancements, especially those in the last few decades, have led to the development of small instruments and thus reduced the degree of surgical trauma for the patient.[5] The rising quality of image transmission and the establishment of 3D in laparoscopy have made it possible to perform precise and delicate operations with minimal blood loss.[6] Especially the magnification of individual and in part strongly vascularized portions of tissue have made it possible to perform surgery with minimal blood loss while being able to visualize the individual layers of tissue. Complications such as postoperative pain, infection or the formation of adhesions have been reduced to a minimum. Sealing instruments, which, by the aid of ultrasound or bipolar current, can also be used to perform coagulation and transect of tissue are mainly employed as disposable single-use instruments.

Adequate hemostasis is essential for performing safe laparoscopic surgery and obtaining a clear and undistorted view of the operating field, identifying endangered structures like blood vessels, the ureter or the bowel at an early point in time, and protecting these. A number of laparoscopic instruments are suitable for this purpose. These can be used to expose the tissue carefully and visualize individual structures leading to vessels, which are then coagulated and transected selectively and safely.[7] In the event of intraoperative bleeding, the available instruments are also suitable for achieving safe and efficient hemostasis and thus continuing the operation by the laparoscopic approach.[8] Technical advancements have also made it possible to use sealing instruments, which, by the aid of ultrasound or bipolar current, can be employed to perform coagulation and transect tissue as well. These instruments were primarily developed for single use. From the economic point of view, this calls for a complex decision-making process with regard to the acquisition and utilization of instruments. The advantages are primarily the fact that an exchange of instruments is not necessary and coagulation can be performed safely.

The development of instruments for hysteroscopy has also been aimed at reducing complications and instrument size. The reduction of the dreaded condition of hypotonic hyperhydration [transurethral resection of the prostrate (TURP) syndrome] is mainly ensured by the use of bipolar systems and physiological saline instead of electrolyte-free solutions.

## LAPAROSCOPY

Laparoscopic interventions are performed through one or more small incisions. The laparoscopic procedure is performed through a closed access (Veress needle, entry under direct viewing) or the open access (Hasson technique). After creating a pneumoperitoneum, one or more ports are placed. The camera system and working instruments are introduced through these ports.

**Table 4.1:** Advantages of minimally invasive surgery compared to abdominal and vaginal surgery

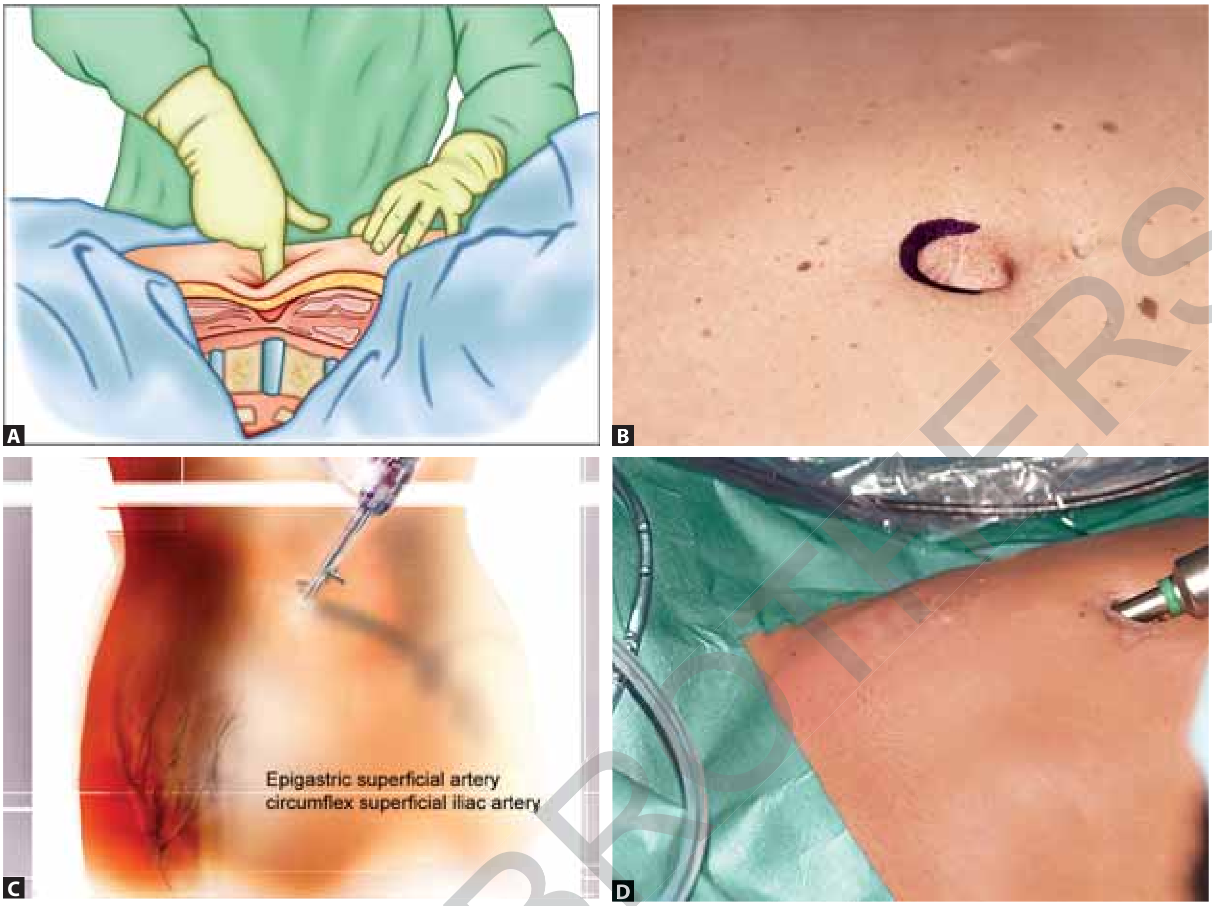
| | |
|---|---|
| **Vaginal Surgery Compared to Abdominal Operations** | |
| *Advantages* | Shorter hospital stays (on average 1 day, 95% CI 0.7–1.2)<br>Earlier return to activities of daily living (mean difference, 9.5 days, 95% CI 6.4–12.6)<br>Lower infection rate, lower rate of postoperative fever episodes (OR 0.42, 95% CI 0.21–0.83)<br>Lower rates of complications such as hernia or impaired wound healing<br>Option of using regional anesthesia<br>Best cosmetic outcome after surgery |
| *Disadvantages* | No possibility to treat comorbid conditions simultaneously<br>The operation is more demanding because of limited space |
| **Laparoscopic Surgery Compared to Abdominal Operations** | |
| *Advantages* | Less blood loss (mean difference 45.3 mL, 95% CI 17.9–72.7)<br>Shorter hospital stay (on average 2 days, 95% CI 1.9–2.2)<br>Earlier return to activities of daily living (mean difference 13.6 days, 95% CI 11.8–15.4)<br>Lower infection rate, lower rate of postoperative fever episodes (OR 0.32, 95% CI 0.12–0.85)<br>Lower rates of complications such as hernia or impaired wound healing<br>Less formation of adhesions<br>Better cosmetic outcome<br>Better and enlarged view for the surgeon because of the adjustable distance of the optical instrument<br>Better view for all surgeons and assistants because the operation can be seen on the monitor<br>More delicate surgery due to innovative instruments aligned to the improved view |
| *Disadvantages* | Longer operating time (mean difference 10.6 min, 95% CI 7.4–13.8)<br>Longer learning curve; the steps of the operation are more complex<br>Higher rate of complications, such as ureteral lesions, bowel lesions, or vascular lesions (OR 2.61, 95% CI 1.22–5.60)<br>Limited tactile feedback<br>A three-dimensional (3D) image only in exceptional cases<br>Higher costs |
| **Laparoscopic Surgery Compared to Vaginal Surgery** | |
| *Advantages* | Less blood loss (mean difference 45.3 mL, 95% CI 17.9–72.7)<br>Comorbid organs or structures can be operated on simultaneously<br>Lower infection rate, lower rate of fever episodes (OR 0.32, 95% CI 0.12–0.85)<br>Less formation of adhesions<br>Better and enlarged view for the surgeon because of the adjustable distance of the optical instrument<br>Better view for all surgeons and assistants because the operation can be viewed on the monitor<br>More delicate surgery due to innovative instruments aligned to the better view<br>More independent of the precise preoperative diagnostic investigation |
| *Disadvantages* | Longer operating time (mean difference 41.5 min, 95% CI 33.7–49.4)<br>Longer learning curve; the steps of the operation are more complex<br>Limited tactile feedback<br>A 3D view is obtained only in exceptional cases<br>Poorer cosmetic outcome<br>Higher costs |

The classical method of entry is described in the following:

## Veress Needle Technique

The operating table is placed in horizontal position before introducing the Veress needle. The patient is placed in Trendelenburg position after creating the pneumoperitoneum. In the normal case the Veress needle is introduced in the region of the navel because the layers of the abdominal wall are thinnest at this site. Prior to the skin incision, the course of the aorta and the site of the iliac bifurcation can be palpated in slim persons (Figs. 4.1A to D).[9]

After testing the functionality of the needle it is introduced at a 45° angle to the abdominal wall, in




**Figs. 4.1A to D:** (A) Typical point of palpation in the subumbilical region. The fingertip is pointing to the promontory. Subumbilical incision and local palpation reveal the short distance from the skin to the spine; (B to D). Diaphanoscopy illuminates the region of insertion of the ancillary trocars while demarcating the superficial epigastric artery and the superficial circumflex iliac artery.



the direction of the uterus. The risk of injury to the large vessels or the intestines is thus minimized. Additionally, the abdominal wall is raised slightly (Figs. 4.2A to C). The more obese the abdominal wall, the more steep the angle of entry will be. In patients who have not undergone previous surgery, the surgeon may need to make two attempts before considering an alternative entry technique or introducing the needle at a different entry point.

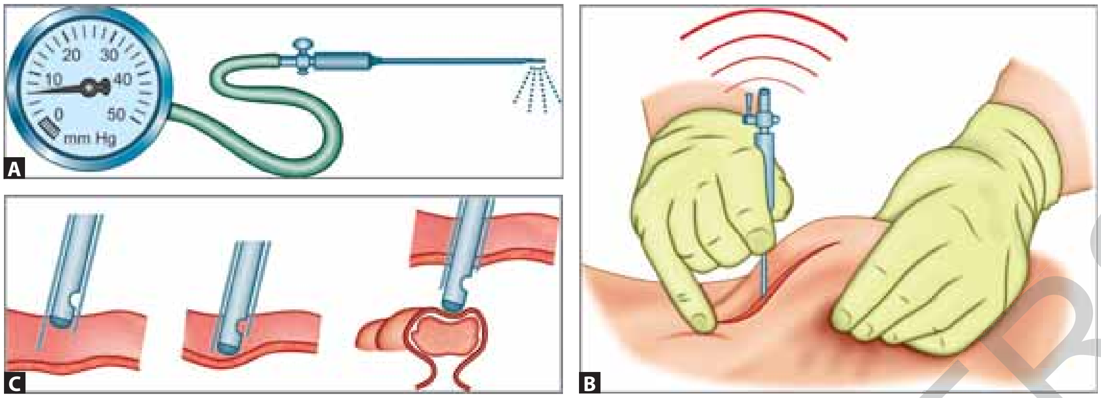
When introducing the Veress needle, in the normal case one hears two clicks. The first occurs after perforating the muscle fascia and the second after perforating the peritoneum.

*Aspiration test:* After inserting the needle the surgeon introduces 5 mL of saline solution; this cannot be done when aspiration is attempted. Incorrect insertion of the needle into a blood vessel or the intestines can be observed here by noting the corresponding body fluid.

*Hanging drop test and "fluid in flow"*: Once the needle has been introduced, raising the abdominal wall causes negative intra-abdominal pressure (IAP). A drop of water placed on the opening will be pulled in by the negative pressure. The needle should not be moved after it has been introduced. If the needle has been inserted incorrectly, the small intra-abdominal defect may tear further and turn into a complex and hazardous lesion (torque is caused by the abdominal wall).

## Alternative Entry Technique

In the meantime we have several approaches for creating a pneumoperitoneum, even directly through appropriate trocar systems. The first description was provided by Artin Ternemian, who made it possible to enter the abdomen before or after creating a pneumoperitoneum, using a screw mechanism under direct viewing (Fig. 4.3). Alternatively, the pneumoperitoneum can be introduced directly and bluntly into the abdomen under direct viewing, after insufflation through the trocar tip. Thus, the pneumoperitoneum can be set up much faster with fewer




**Figs. 4.2A to C:** Veress needle and its insertion. The safety mechanism avoids damage or injury to the bowel or vessels.

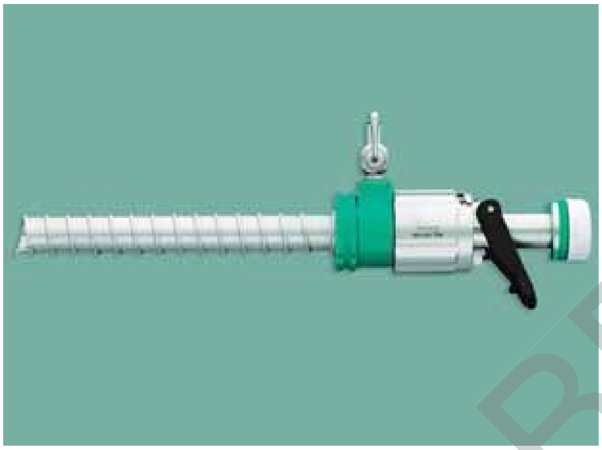


**Fig. 4.3:** Direct entry mechanism with the EndoTip (Karl Storz Company).

**Fig. 4.4:** Kii Advanced Fixation (Applied). Offers unsurpassed abdominal wall fixation with minimal depth into the peritoneal cavity. The nonlatex, nonfragmenting balloon provides superior abdominal wall retention compared to other sleeves and ensures minimum penetration of the trocar into the operative field. The retention disk slides down to maintain the sleeve position in the abdomen, securing the trocar in place and virtually eliminating unintentional displacement or forward migration.

instruments, while deleting several (safety) steps (Fig. 4.4).

Insufflation can then be started, initially with 1 liter of $CO_2$ gas/min, and then increased to 3–5 L/min. The total volume depends on the patient's height and degree of relaxation. Even after the instillation of 300 mL of $CO_2$ gas distributed uniformly in the intra-abdominal aspect, there is a perceivable *physiological damping of percussion* by the liver. The initial target pressure can be adjusted to 20–25 mm Hg in order to achieve the maximum distance between the abdominal wall and intra-abdominal structures.[10]

A 5-mm optical trocar can be introduced initially, provided this view is sufficient for the planned operation; a 10-mm optical trocar may be introduced instead. The trocar must be introduced by the so-called Z-technique so that it is shifted sideways by a few millimeters subcutaneously in order to achieve functional closure of the fascia and prevent the formation of a hernia after the operation.

However, one achieves maximum safety by using the two-step principle. Step 1 consists of the introduction of a 5-mm optical trocar to avoid injury or adhesions. Before dilatation to 10 mm, $CO_2$ gas is instilled again safely through the intra-abdominal approach. Step 2 consists of introducing a place holder through the 5-mm trocar, followed by the introduction of the 10-mm trocar.[10]

## Subcostal Insufflation Technique (Palmer's Point or the Lee–Huang Point)

No entry technique is entirely devoid of the risk of gas embolism, injury to vessels, the urinary tract or the bowel. However, entry through Palmer's point provides maximum safety, especially when the surgeon anticipates umbilical pathologies. In 1974 Raul Palmer described an alternative entry point in the medioclavicular line, about 3 cm below the costal arch. In rare cases, when the patient has undergone previous surgery in the left subcostal region, the Lee-Huang point may be used. This is located in the midline, below the xiphoid. However, when introducing the trocar it should be noted that the falciform ligament may be directly in intra-abdominal location. Besides, gastric suction must be performed before introducing the Veress needle or the trocar (Figs. 4.5A to D).[10]

## Introduction of Working Trocars

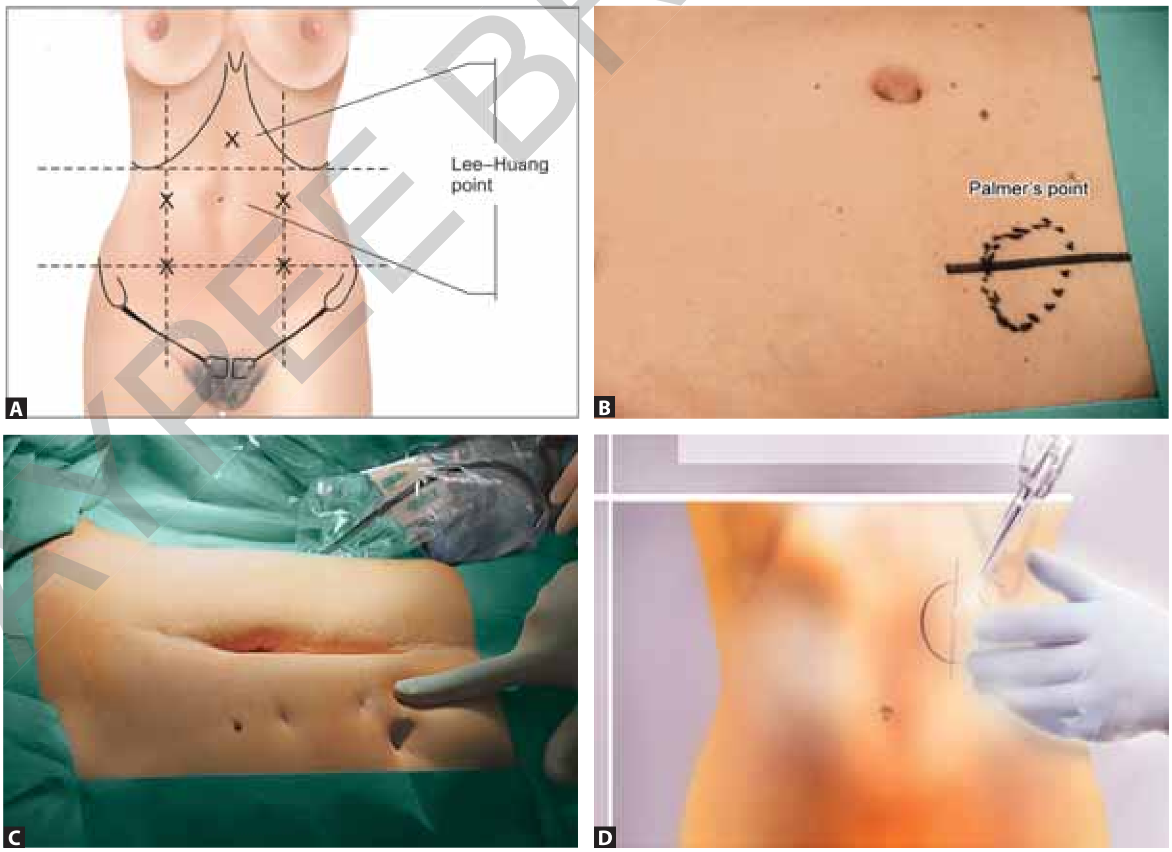
The patient is placed in the Trendelenburg position before the introduction of working trocars. All working trocars should be introduced under maximum IAP and absolutely clear vision. The inferior epigastric artery is visualized from the inside in the lateral umbilical plica. The region lateral to this point must be screened for superficial arteries (the superficial iliac circumflex artery and the superficial epigastric artery) by performing a diaphanoscopy. From the outside the area is about two finger widths medial to the anterior superior iliac spine. Once the working trocar has perforated the peritoneum, it is swung over to the uterus, thus moving away from the large vessels and the intestines.

The number of working trocars may vary; the same is true of the preferred position. The latter may be symmetrically on the left and right side, or the left and middle, or the left aspect and the left-sided mid-abdomen (Figs. 4.6 to 4.8).[2,10] A number of single-use or reusable trocars are now available for this purpose.

## Practical Handling of Instruments

The very specific technical features of the operating field in laparoscopy and the corresponding instruments may even limit the actions of experienced surgeons, especially when the patient experiences significant intraoperative bleeding or the conditions of surgery are rendered difficult by extreme obesity,






**Figs. 4.5A to D:** Alternative entry site showing (A), in cases of a large uterus, especially at or above the level of the umbilicus: the Lee–Huang point. This point is recommended for video-assisted laparoscopy or in cases of anticipated adhesions in the region of Palmer's point (C); (B to D) Palmer's point is situated in the midclavicular line, about 3 cm below the costal margin.

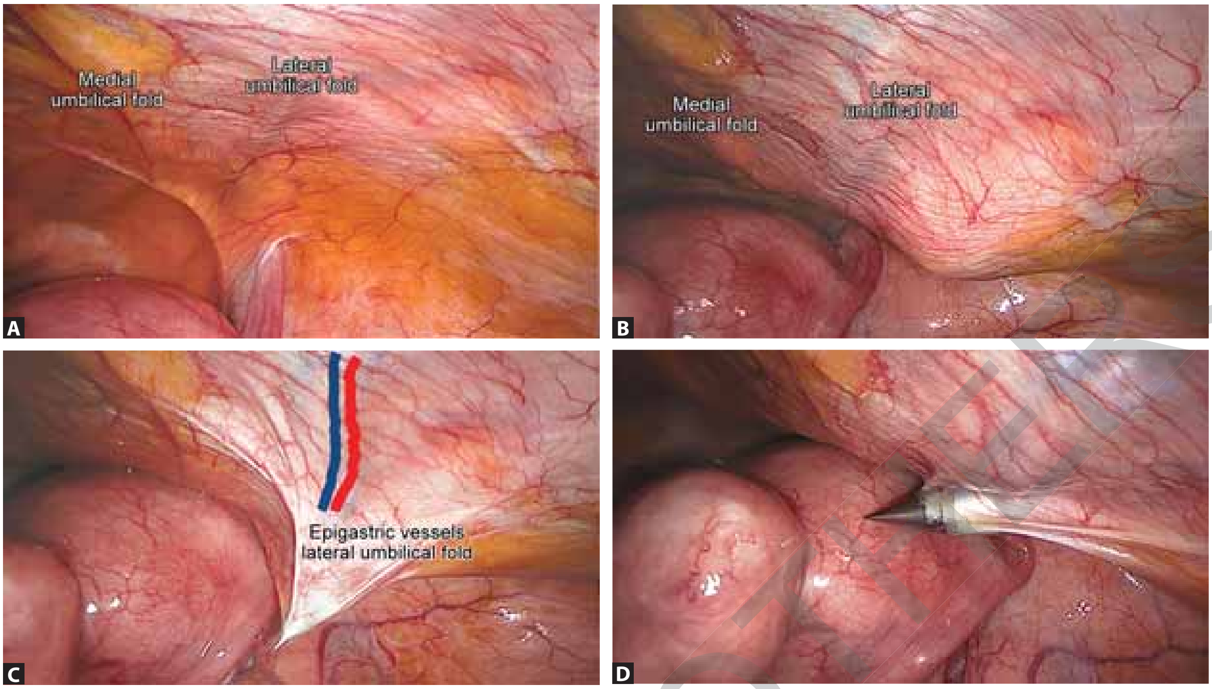

**Figs. 4.6A to D:** (A and C) Point of insertion from the outside (two-finger widths medial to the anterior-superior spine), at a 90° angle to the surface, with penetration of all layers of the abdominal wall. Trocar insertion site lateral to the lateral umbilical fold; (B and D) Overview after insertion of the laparoscope and three ancillary trocars.

a limited head-down tilt position, comorbid conditions, or adhesions. Compared to open surgery, the surgeon lacks depth perception due to the currently widespread two-dimensional (2D) view. The optical device introduced into the abdomen limits the surgeon's field of vision. As a result, some of the instruments may be withdrawn unobserved from the operating field, or may manipulate or injure tissue without being detected. Concealed bleeding or injury to organs outside the field of vision may not be identified (immediately). Compared to open surgery, laparoscopic instruments are greatly limited in their range of motion. The missing degrees of freedom (four versus seven) and the lever action on the abdominal wall may hinder complete visualization of the operating field as well as that of specific organ structures. Further difficulties include the limited use of instruments and the fact that trocar placement depends on the anatomy of the individual patient.

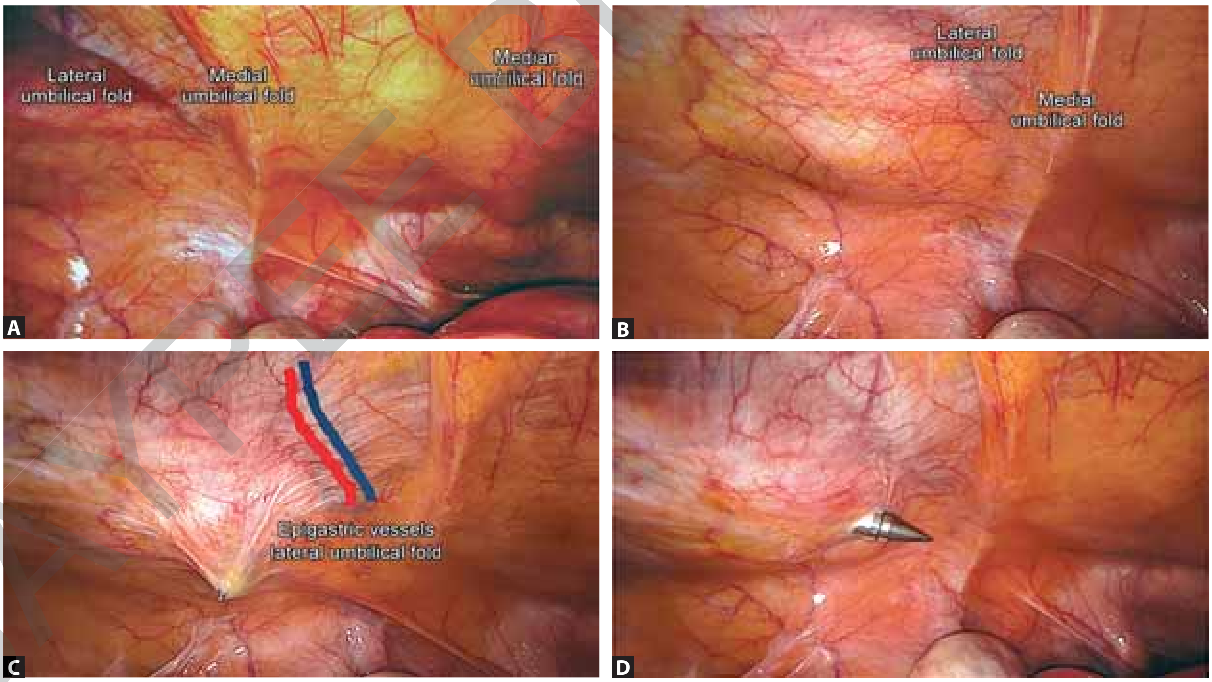
The view of the operating field may be impaired by impurities in the optical instruments. This may be caused by bleeding, secretion of body fluids, or even vapor or fog on the optical instrument due to coagulation. The port systems have to be opened repeatedly for ventilation, which causes fluctuations of IAP and alterations in the temperature of the $CO_2$ gas. The illumination system of the optical instrument may limit visibility in cases of extensive blood deposits. The surgeon must get used to semi-paradoxical hand movements, such as left is right, right is left, below is above, above is below, inward is inward, outward is outward, clockwise is clockwise, and anticlockwise is anticlockwise.

## HYSTEROSCOPY

In hysteroscopy the entry technique is limited to the setting and dilatation of the cervical canal. This is traditionally achieved by probing and dilating the




**Figs. 4.7A to D:** Secondary trocar placement, entry in the right lower abdomen. (A) The three different plicae are visualized; (B) The palpating finger is showing the area lateral to the lateral umbilical fold; (C) Entry of the sharp ancillary trocar in the lateral aspect of the lateral umbilical fold; (D) Once the peritoneum has been penetrated, the trocar points to the fundus of the uterus in order to avoid injury to the major vessels and the bowel.




**Figs. 4.8A to D:** Secondary trocar placement, entry in the left lower abdomen. (A) The three plicae are visualized; (B) The palpating finger is showing the area lateral to the lateral umbilical fold; (C) Entry of the sharp ancillary trocar in the lateral aspect of the lateral umbilical fold; (D) Once the peritoneum has been penetrated, the trocar points to the fundus of the uterus in order to avoid injury to the major vessels and the bowel.

cervical canal to Hegar number 8 for diagnostic hysteroscopy and Hegar number 9 for operative hysteroscopy. Preparation of the cervix with misoprostol (400 µg administered until 12 hours preoperatively) reduces the risk of injury (avulsion injury due to the forceps, perforation, bleeding).

The hysteroscope consists of a single instrument. Techniques of image transmission and light sources were developed for this technique in the same manner as they were for laparoscopy. However, the use of hysteroscopy for the treatment of endometriosis is limited to exceptional cases such as confirmation of the diagnosis or simultaneous operations, including chromopertubation.

## IMAGE PROCESSING SYSTEMS

Although minimally invasive surgery is a rather modern surgical procedure, its origins date back to 100 years ago when, in 1901, Kelling first viewed the intra-abdominal organs of a dog with a rigid endoscope. Subsequent advancements were mainly hindered by the absence of adequate light sources. Rapid and simultaneous technological developments, and the immense efforts of the industry were responsible for the success of minimally invasive surgery (Figs. 4.9 to 4.13).[11-13]

**Fig. 4.9:** 1960: Invention of the cold light source (Karl Storz Company).

**Fig. 4.10:** 1962: The beginning of laparoscopy (Karl Storz Company).

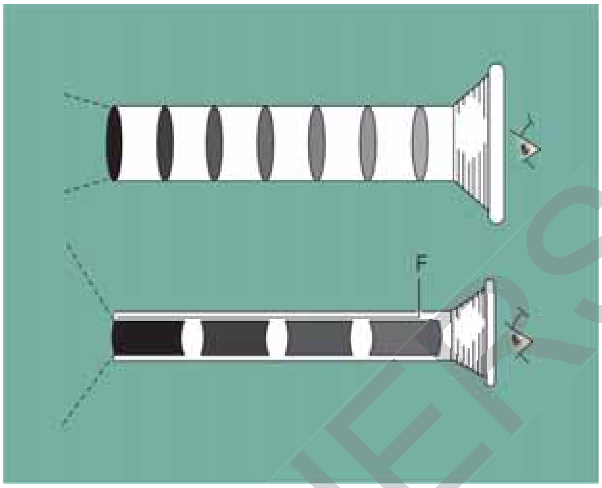



**Fig. 4.11:** 1965: Introduction of the HOPKINS® rod lens system (Karl Storz Company).

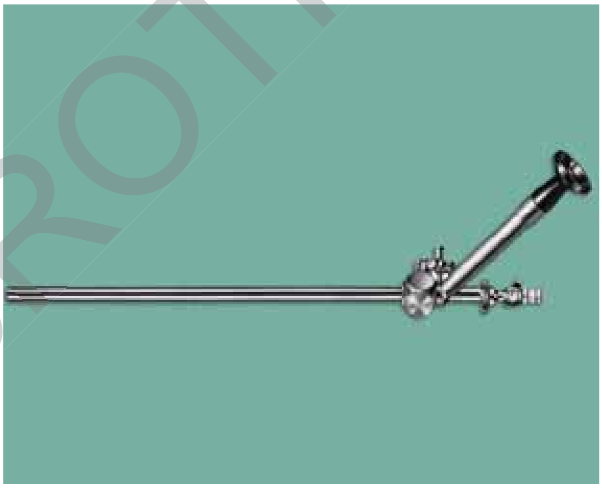


**Fig. 4.12:** 1973: The beginning of gynecological endoscopy for diagnostic investigation and treatment (Karl Storz Company).

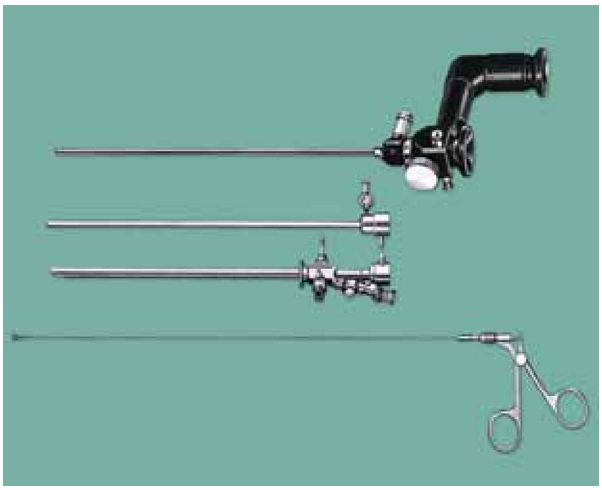


**Fig. 4.13:** 1980: Introduction of the HAMOU® Micro Contact Hysteroscope with a diameter of just 5 mm (Karl Storz Company).

## Endoscope

In most cases the laparoscope is a rigid endoscope used to illuminate the abdominal cavity and transfer the images to a monitor. In some cases, blunt manipulation can be performed with the laparoscope itself. Conventional laparoscopes are provided with a 0° lens or a 30° lens (Fig. 4.14). The innovation of the laparoscope now permits the use of so-called flexible-tip laparoscopes and the transfer of 3D images to the monitor (Fig. 4.15). Selection of the

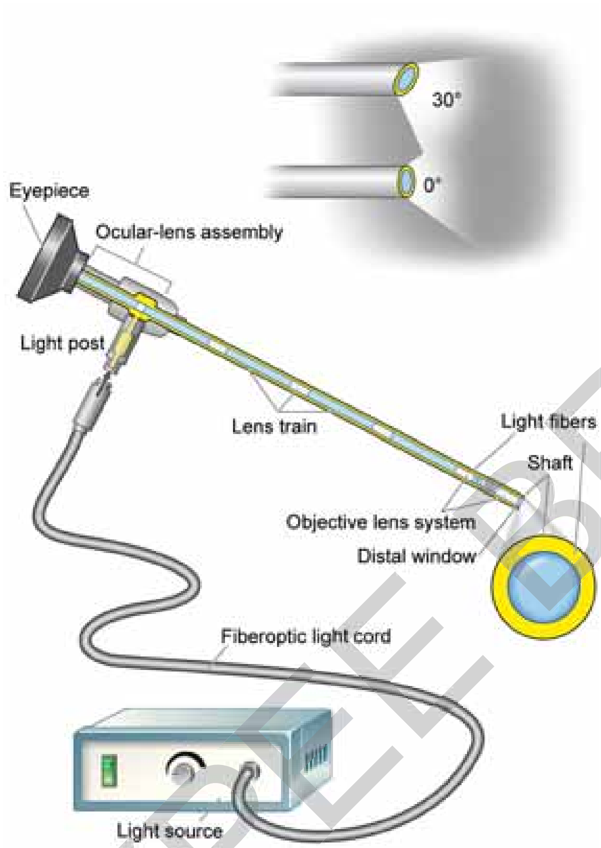



**Fig. 4.14:** Light post—Fiber-optic light cords are attached to the scope at this site.

Light fibers—Glass fibers that carry light from the light post to the distal end of the scope.

Objective lens system—A collection of lenses, windows, and/or prisms located at the distal end of the scope. The distal objective can be manufactured at angles ranging from 0 to 120°, which enables the operator to see areas that might otherwise be out of view.

Lens train—A series of glass rod lenses and spacers that transfer the image through the shaft.

Shaft—Stainless steel tube that houses the lens train.

Ocular lens assembly—The focusing lens of the scope located near the proximal end of the scope.

Eyepiece—The eyepiece is located at the proximal end of the scope. The image can be viewed through the scope, or the eyepiece can be attached to a camera coupler to view the image on an external monitor.

**Fig. 4.15:** Das EndoCaMeleon (Karl Storz Company) is a special optic device, which, thanks to the swiveled prism, permits the surgeon to set the viewing angle from 0 to 120° during endoscopic investigations.

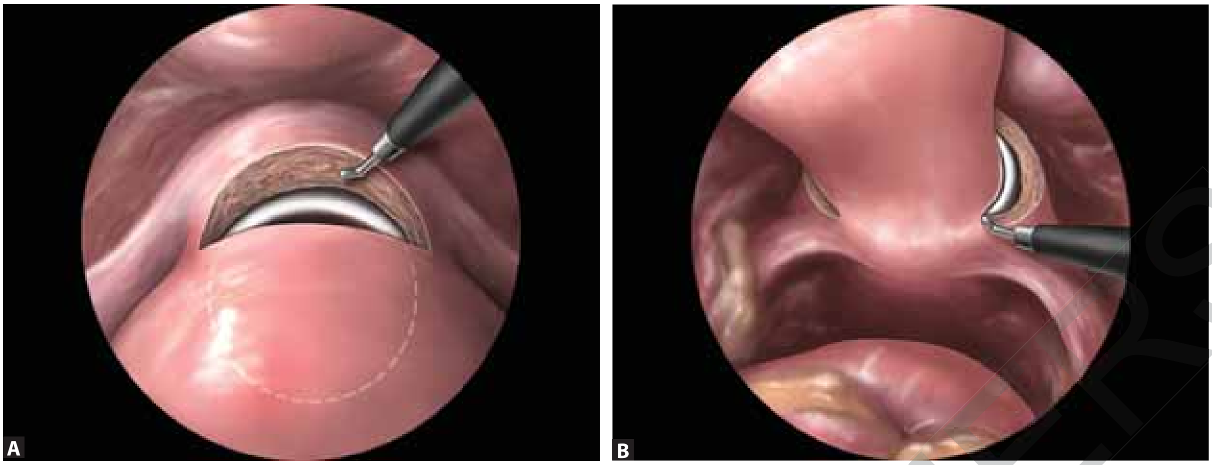
laparoscope depends on the surgeon's preference and its local availability. Thus, it is also dependent on the availability of resources. The large majority of operations can be performed with a 0° optical instrument. In specific situations, such as removal of the uterus in laparoscopic hysterectomy or exposure deep into the pelvic wall in cases of deep infiltrating endometriosis, the 30° endoscope provides a better view. It permits targeted viewing in a specific direction, which would be less clear under 0° conditions (Figs. 4.16 to 4.19).

### *Structure of the Rigid Endoscope*

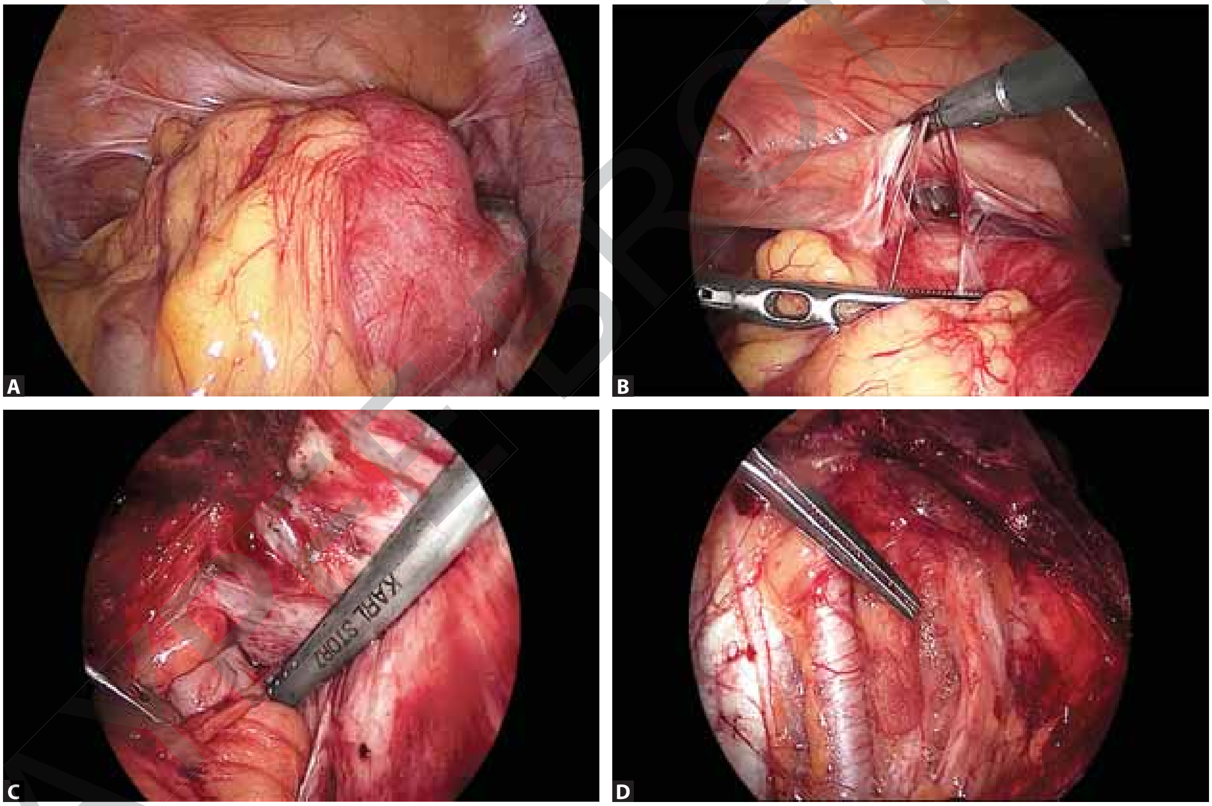
The rigid endoscope is a solid metal tube with two channels, containing an ocular or a connecting device to the camera at its proximal end and a camera lens at its distal end, which takes the intraoperative picture and transfers it through a lens system or a chip system. The essential elements of a laparoscope are shown in Figures 4.11 and 4.14.

The first channel of the laparoscope forms a ring along its outer margin and contains bundled glass fibers coursing longitudinally along the laparoscope and transferring light from an external light source to the tip of the endoscope.

The second and central channel consists of several rod lenses made of quartz glass, which conducts light. Light is refracted at the air lenses between the rods. Owing to the powerful light, very small lens diameters are sufficient. In modern endoscopes the central channel is connected to a camera system. Digital chip systems in the camera allow the surgical



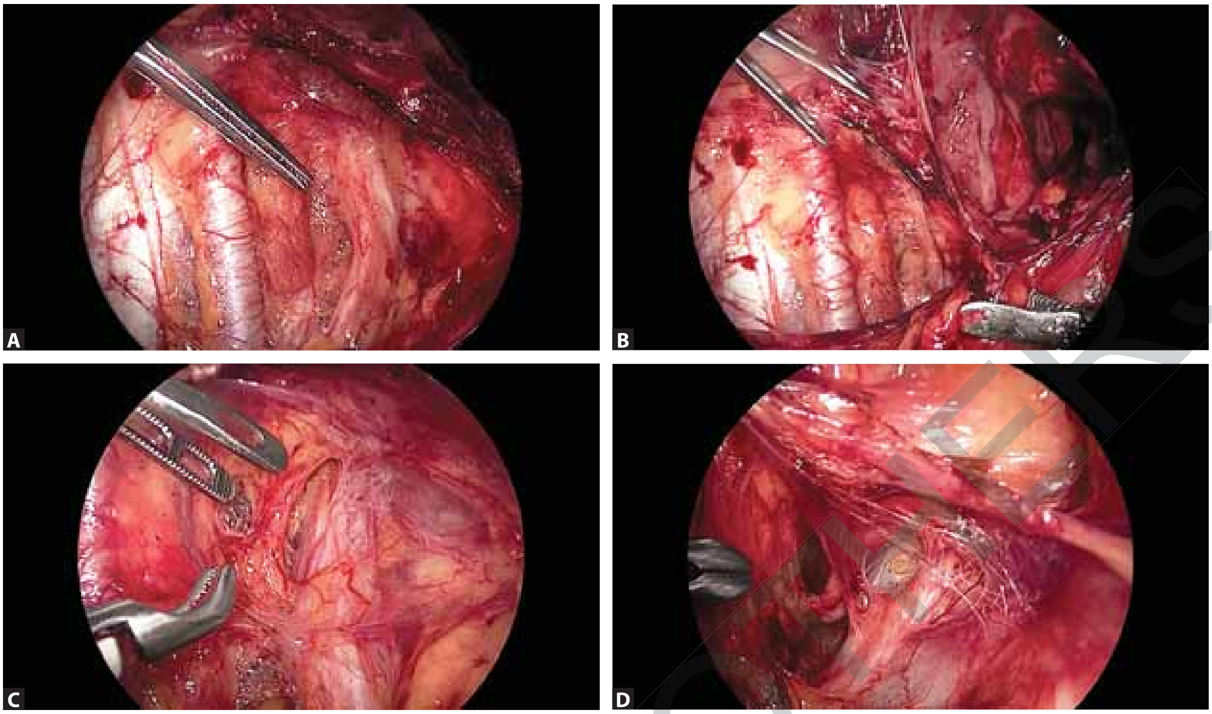
**Figs. 4.16A and B:** Schematic illustration of uterine dissection. (A) Colpotomy is usually started in the anterior part, on the palpable manipulator cap; (B) Intrafascial hysterectomy can be completed with the sacrouterine ligaments in view.



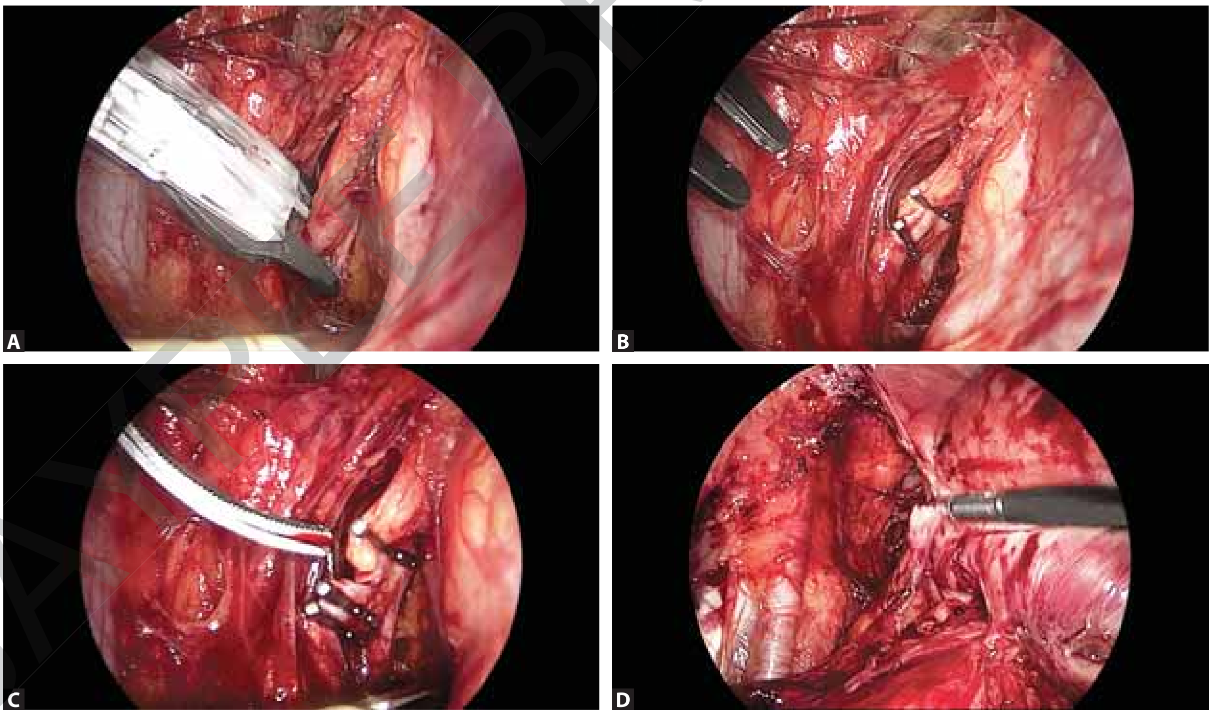

**Figs. 4.17A to D:** (A) A case of severe adenomyosis of the uterus with subsequent adhesions of the bowel; (B) The bladder peritoneum; (C) Access to the lateral aspect of the uterus is closed; (D) Retroperitoneal access is necessary.

image to be transferred to an external monitor. The diameter of rigid endoscopes ranges between 3 and 12 mm thinner endoscopes provide a weaker image because much less light is able to pass through the central channel.

The lens system is located at the distal end. It may be straight (0°) or angulated (to 120°). The angulation permits the surgeon to view intra-abdominal objects, which would otherwise be outside his or her image frame. The 0° optic system provides a panoramic view while the angulated lens provides viewing angles that permit the surgeon to operate around the targeted surgical structures and work in deeper regions under direct viewing (Figs. 4.20 and 4.21).



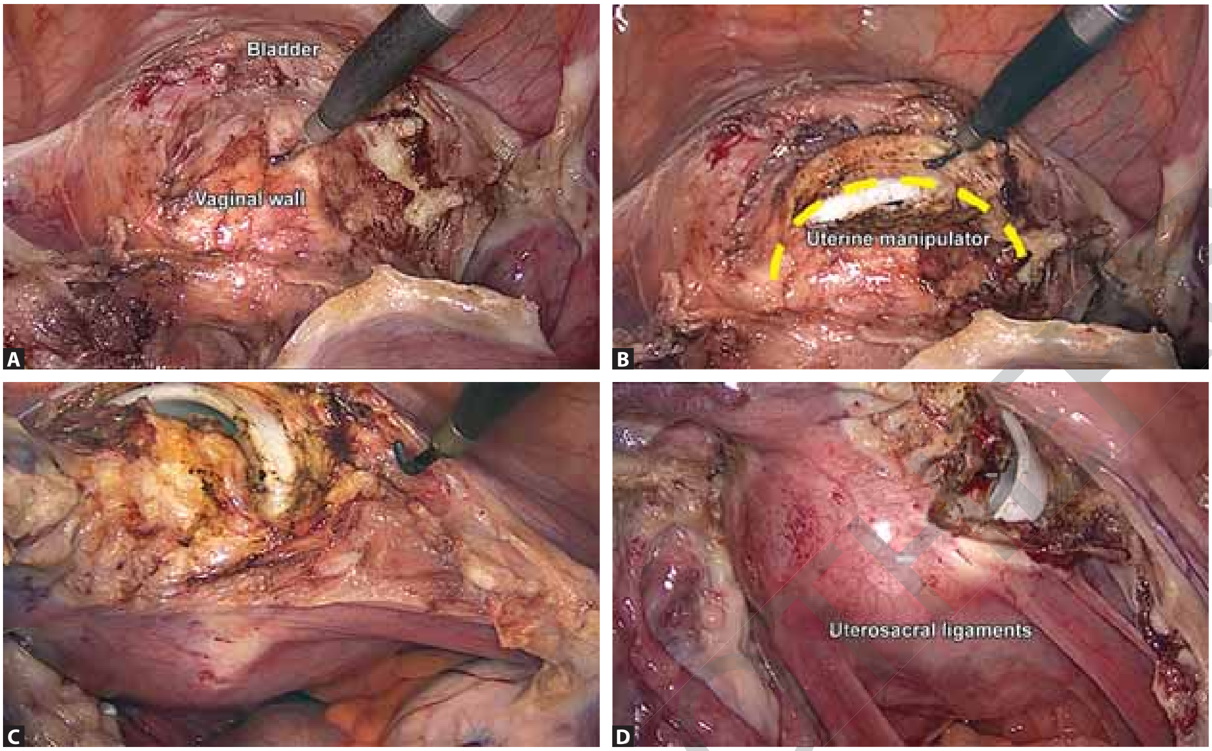

**Figs. 4.18A to D:** (A) After localization of the external iliac artery, the ureter is usually found adherent to the peritoneum. A major lymph node lies in between; (B) Opening the pararectal and; (C) the paravesical fossa; (D) The crossing point of the uterine artery is demarcated, and the ureter is left in its adventitia to avoid skeletonizing and denudation.



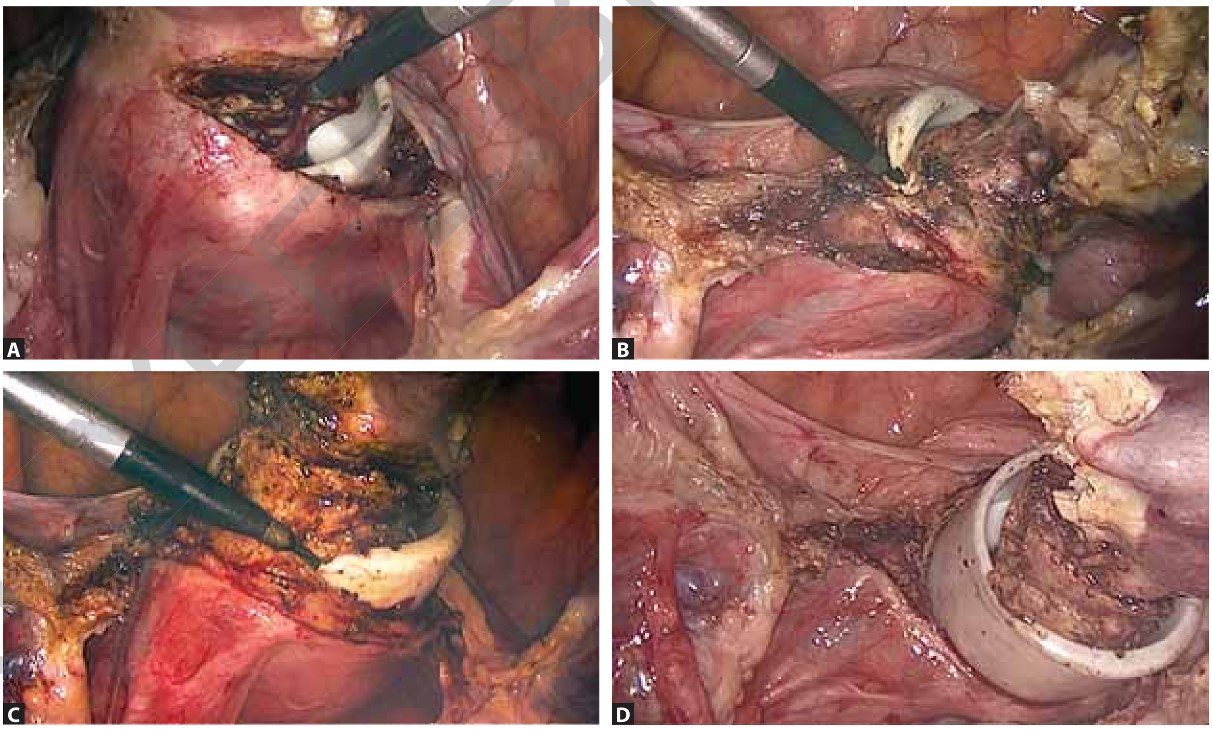

**Figs. 4.19A to D:** (A and B) Clips can be inserted and the artery can be closed and cut; (C) The uterine vein (deep) is seen just beneath the cut artery; (D) Overview of the exposed situs. To the right you see the uncolored uterus after closure of both arteries.

## Light Source and Fiber Optics

Adequate illumination is a prerequisite for a safe operation. In the large majority of endoscopes, the light source is outside the operating field because it needs more space and is subject to excessive warming when in use. Usually xenon lamps are used. These are expensive and do not last long. The technique of




**Figs. 4.20A to D:** In this case of LTH, the distance between the vagina and the bladder is increased because of exposure of the bladder peritoneum (A); The intrauterine manipulator is firmly placed in the abdomen and dissection of the uterus from the vagina is performed in a stepwise manner (B–D). The conjunction of the sacrouterine ligaments is left in place.




**Figs. 4.21A to D:** Completion of the dissection of the vagina from the cervix (A to C) and commencement of retraction of the uterine cervix, still grasped by the manipulator forceps, transvaginally. Excessive lens fogging caused by the monopolar current and the sharpness of the monopolar hook makes it necessary to perform precise exposure under full vision. This can be done during simultaneous retraction/manipulation with the use of the 30° optic device. The surgeon's vision may worsen immediately when $CO_2$ gas leaks through the colpotomy. Visibility may then become extremely poor and the use of monopolar energy hazardous; (D) Final dissection of vagina from cervix to be added at the end.

**Fig. 4.22:** Cold light fountain XENON 300 (Karl Storz Company).

**Fig. 4.23:** Full high-definition (HD) camera system (Karl Storz Company).

light-emitting diode (LED) lamp system has created entirely new options and is an interesting alternative for experimental applications (Fig. 4.22).

## Image Conductors

Fiber glass serves best as an endoscopic light conductor. Gel-filled fiber optics are an alternative; they provide greater luminous efficacy, but cannot be bended and are more expensive. Light transmission into the body's interior increases with the number of glass fibers, their diameter, and the quantity of supplied energy. Image conductors consist of several thousand glass fibers with a thickness of 7–10 μm. Thus, one achieves 3,000 to 42,000 or 75 × 45 to 240 × 180 pixels. Every fiber is able to transmit information about brightness as well as color.

The camera head is provided with an image processor and a mechanical zoom function as well as a focus ring (Fig. 4.23).

## Three-Dimensional Imaging

In open surgery as well as in our normal lives, we are accustomed to 3D images. Getting accustomed to the 2D image is one of the greatest challenges faced by surgeons learning minimally invasive surgery. The image is reduced to two dimensions. Depth perception is impossible. The third dimension has to be substituted by experience and imaginative power. However, 3D endoscopy permits the surgeon to view space in a similar fashion as natural vision. This bears the promise of a shorter learning curve, shorter operating times, and fewer complications. Most of all, a 3D endoscope is able to delineate complex structures more clearly, including their location and their relative position in the body.

**Fig. 4.24:** Drilling on the 3D trainer of Karl Storz Company at the Kiel School of Gynaecological Endoscopy.

Special camera systems or so-called stereoscopes utilize two adjacent imaging systems that correspond to the human eye. The development of stereoscopes dates back to 100 years, although they are still not used everywhere. The persistent and greatest technical handicap is the type of image transmission that will permit the human brain to perceive the image three-dimensionally. Wearing 3D glasses is an option, although inconvenient in the operative setup (Fig. 4.24). Recent technical advancements have made it possible to transfer 3D images without the use of 3D glasses. However, such visualization is still in its initial stages and not established everywhere.

The part of minimally invasive surgery that was focused from the very start on 3D work was robotic surgery. Two separate cameras are used within a single optic instrument, and these simulate the human eye. The image is optimized digitally and then transferred to the operation console. The surgeon views

## PRACTICAL MANUAL FOR
# LAPAROSCOPIC & HYSTEROSCOPIC GYNECOLOGICAL SURGERY

Jaypees are proud to come out with the Third edition of *Practical Manual for Laparoscopic and Hysteroscopic Surgery* of The Kiel School of Gynecological Endoscopy in Germany based on 2 earlier editions in 2006 and 2013.

This book is a unique guide and cookbook for operative decision-making techniques in female endoscopic pelvic surgery. It is a landmark in the reality of gynecological endoscopy in 2019. For the full spectrum of gynecological problems requiring surgical intervention, this volume examines the anatomy, preoperative evaluation, surgical strategy, details of techniques and instruments, postoperative management, anticipated results, and possible complications.

Special features for interaction with urologists and general surgeons are detailed. Injuries to adjacent organs, as to bowel, urinary system, and pelvic vessels are also discussed.

This volume is divided into four sections—basics and anatomical aspects of endoscopic surgery, specific gynecological laparoscopic procedures, specific hysteroscopic procedures and complications in laparoscopic and hysteroscopic surgery. After basic aspects in Section 1, the main chapters (Sections 2 and 3) deal with step-by-step laparoscopic and hysteroscopic surgery. The fourth section explains complication and is important for the management of the gynecologist whose surgical background may not include gastrointestinal or urinary tract surgery.

Although the book should be most useful to gynecologic residents-in-training and practicing gynecologists, it can also be of use to general surgeons who perform gynecologic operations and to all physicians who perform ambulatory gynecologic procedures.

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