MOURET Instruments for Laparoscopy
An introduction from Prof. Mouret on the background of the development of the MOURET Laparoscopic Instrument Set

This set of laparoscopic instruments is the result of lengthy reflection on the movements involved in laparoscopic surgery. From this reflection resulted the following:

To provide the surgeon with laparoscopic instrumentation that offers the same level of procedural comfort and “usability” as one has with conventional surgical instruments and in so doing recreate the familiar feel of procedural movements and guarantee efficiency, comfort and safety.

The underlying idea is that, despite the obvious peculiarities, there is no fundamental difference between laparoscopic and traditional surgery.

Laparoscopic surgery is not a new kind of surgery; it is a way of carrying out the old.

The instrumentation should thus be designed to allow the surgeon to employ as closely as possible the same movements as for open surgery, using as far as possible instruments which function as in traditional surgery.
The historical bases:

- Surgery and endoscopy are two worlds which were born separate of each other and which for a long time paid little attention to each other.
- One was practiced by surgeons: surgical procedures and incisions went hand in hand.
- The other was an investigative technique and thus was used purely for exploratory purposes in the diagnostics stage. It was an essentially medical domain.
- These two worlds were brought together and merged with each other over a series of steps:
  - Urology is intrinsically and traditionally both a medical and a surgical speciality. It was with this speciality in mind that the industry took its first tentative steps. It all started with bladder examinations. As soon as the idea of employing endoscopic vision in interventions appeared – for which the urethra was implicit – so too, of course, did the introduction of coaxial instruments with telescopes come into being. ‘Pistol grips’ are a legacy of and are consistent with the requirements of a coaxial route.
  - Today’s endoscopic instruments still show the indelible influence of this period.
  - Of course, even as gynecology adapted endoscopy for its own purposes, it preserved the instrumental conception of urology. For a long time, operations remained reserved and restricted, bound by the imposed constraints of creating only one trocar opening – a sort of ‘fictive urethra’.
  - Alongside the enormous advances in imaging in the field of gynecological pathology, Raoul Palmer also showed that certain procedures were only possible via the addition of palpation probes and additional trocars. A timid step, but nevertheless a very important one.
  - Gynecologists – in particular Hubert Manhès – took on the task of developing instruments that would make it possible to truly carry out surgical procedures. Such instruments were and remain the benchmark for the industry.

Our range of instruments were created keeping this background in mind. Indeed, they essentially retain the earlier developments. However, we have worked hard to correct certain peculiarities of traditional endoscopic instruments and to bring them closer in line to classical surgical instruments and with the movements of surgical procedure.

**N.B.: No surgical instrument is totally ‘atraumatic’. This applies equally to instruments used in laparoscopy.**

There are certainly jaws with more or less aggressive designs, but it is the manner in which they are used that decides which is the more or the less traumatic.
Trauma, if it occurs, could include:

1. Visceral or vascular perforation due to an aggressive jaw and/or excessive clamping.
2. Squeezing of tissue, which can lead to necrosis (often secondary).
3. Above all, as in cases where the instrument’s grip slips, trauma could include damage to the peritoneum and/or possibly tearing of the underlying tunicae.

Paradoxically, it is often the jaws deemed ‘atraumatic’ which are involved in this type of injury as, in order to compensate for the failure to grip that leads to slipping, they can be excessively clamped.

The traumatizing character of the instrument depends on the shape of the jaws and the teeth. Moreover, the more inflexible the jaws, the greater the pressure exerted. The inflexibility of the jaws is directly related to their length – the shorter the jaw, the more inflexible.

It is for this reason that the majority of inserts in this kit have been designed with longer, and thus less rigid, jaws.

On the other hand, however, shorter jaws allow for very powerful grips, without inopportune slipping, which can be required in certain procedures.

The development of this range of instruments was guided by the following principles:

We focused on the operative part of the instrument and its handle.

The CLICKLINE concept, which allows each instrument to be modified and adapted in line with the surgeon’s preferences and habits, results in a wide variety of instruments.

This concept has allowed us to consider and study each element of the instrument separately. However, the homogeneity of the whole has to remain in the forefront. The designer’s concern is to avoid any incompatibility between the different elements. It is the user of the instrument, first and foremost, who will select the combination of jaws/handles which suit his/her needs and method of working.

Essentially, the surgery is performed by the surgeon using two hands, assisted by one or more instruments operated by the assistant(s).

The typical configuration is as follows: Two instruments (grasping + forceps) for the surgeon; a suction device that doubles as a retractor is held by the assistant.
The camera is held by an assistant who is entrusted with this specific task. This enables the surgeon to work with both hands. There is no longer any reason for the surgeon to hold a coagulation hook in their right hand – the privileged place it once took when the surgeon managed the camera themselves or even worked directly through it (using the eyepiece). The coagulation hook still has a certain usefulness, however. It is easy to handle and having it has become almost second nature to many surgeons.

The basis for the surgical procedure remains as follows: ‘dissecting forceps’ (grasping forceps) in the left hand, scissors (or other instrument) in the right hand.

The function inherent to all forceps is to grasp

However, the purpose for grasping may differ:

•Retention and immobilization to permit the dissecting instrument in the surgeon’s right hand to be used (scissors, other forceps, electrode etc.).
•Temporary hemostasis prior to coagulation or other method of hemostasis.
•General retraction and mobilization.

The instrument suited to each of these tasks depends more on the organ to be grasped than on the task to be carried out. Differences in the resistance of tissue, the consistency of tissue, the tendency of tissue to slip from the jaws of the instrument at an applied traction force make it impossible to achieve complete instrumental versatility, as in traditional surgery. Hence, a range of different instruments is required.

For a given intervention, however, where the organs to be grasped are more or less homogeneous, one type of forceps (maybe two) will be used – seldom three in the same intervention.
A standard set of laparoscopic instruments as recommended by Prof. Mouret:

- Fenestrated forceps. We have redesigned the shape of the fenestration and given the base of the jaws a relief to improve retention.

- Micro-toothed forceps. Usability more or less corresponds to dissecting forceps, the source of our inspiration.

- BABCOCK forceps: short, powerful and particularly retentive (photo shows the insert’s jaws), can be used only on resistant organs or on the very thick walls of an organ destined for removal (to which eventual cuts are not detrimental). The perfect example of this is the taut, renitent wall in cases of acute cholecystitis, even after paracentesis has been carried out. These forceps, designed for a quite specific application, are generally used only briefly during the course of the intervention.

- These delicate grasping forceps have a very different function due to the flexibility of their longer jaws. They can be used to grasp a normal (i.e., having thin walls) colon, stomach or bowel delicately, yet without slipping. Their teeth are similar to the so-called “velvet paw” forceps, whose name signifies their delicate grip.
• **The dissector has longer jaws.** It seemed pointless to provide this instrument with a sizeable angle, sometimes exceeding 90°, since the existing fixed point of the parietal passage prevents the use of this angle (to circumvent a vessel and pass a cord through, for example, as one would do in traditional surgery). The procedure is somewhat different from that of traditional surgery. The recommended handle corresponds to that of the dissecting forceps with or without an opening spring.

• **The needle holder** features fine and straight jaws that supports all possible ways of grasping a needle.

The *extracorporeal knot pusher* rounds off this range of instruments. It allows the surgeon to quickly and safely make knots that are difficult to tie intracorporeally. It operates on the following principle: knot is pushed downwards while the instrument is kept closed passively by means of a spring on the handle; active opening of the handle grips (as one would with the two index fingers in open surgery) ties the relevant knot. To enable this active opening movement of the handle grips, the opening/closing mechanism has been reversed (i.e., at rest, the forceps are closed). They can, thus, be guided into and out of the trocar without difficulty. The tension in the handle – achieved through squeezing (the only forceful and controllable movement that can be made by the hand) – permits the surgeon to position the knot with precision and to adjust the amount of force exerted according to tissue type and resistance of the suture.

By rotating the system, the surgeon can place the knot as required as a “half-hitch” or a reef knot. Such reversal in the function of the handles takes a little time to get used to but once a surgeon has managed this, the comfort and benefits of the system are incomparable.

The handle is not equipped with a locking system.

N.B.: These forceps inserts have been designed to fill the apparent gaps in existing instrumentation but they do not by any means render the former obsolete.
A standard set of laparoscopic instruments as recommended by Prof. Mouret:

- **MANHES grasping forceps.** Can cause trauma to the delicate digestive organs but they have the power that is sometimes necessary to grasp sclerolipomatous viscera (e.g., an appendicular wall). On the other hand, they can also be used to forcefully grasp very fine tissue such as, for example, a loose and detached peritoneal leaf.

- **“Tiger” forceps.** These forceps are meant for a specific function but can come in very handy generally. The strength of these forceps when grasping, for example, an ovarian cortex, is comparable to no other. These are the hook forceps of laparoscopy and always having a pair in reserve is a good idea.

- **RoBi® bipolar forceps** – excellent for hemostasis. Having the instrument in reserve is a very useful safeguard!

- **The MANHES bipolar forceps** features a simple yet robust design which acts as a guarantee of reliability whatever the task.

- **The scissors** we use are the METZENBAUM-type scissors which are the most suited for dissection by means of “discission – transsection”. This is our preferred technique.
The standard handles used on laparoscopic instruments seemed to us to be the elements furthest removed from the traditional instrumentation of conventional surgery and we have made substantial modifications here to restore the user-comfort of the instrument – something we wished to maintain or to rediscover to the greatest possible extent.

The ratchets or different types of locking system used for closing laparoscopic instruments do not work at all like ratchets on surgical instruments for conventional surgery.

In our view, it seemed essential to provide surgeons with handles functioning according to the “forcipressure” principle. Virtually all conventional surgical instruments are based on this principle.

“Forcipressure” is a locking system effected by a controlled squeezing action (beyond complete closure of the instrument, thus making use of the elasticity of the handle grips and jaws).

It is released by twisting the handle grips of the instrument. Locking and release both require the handle arms to be finer so as to offer sufficient flexibility.

This characteristic has been developed for both types of handles (straight and pistol) and in particular for the handles of the needle holder which, being longer, are far more flexible.
Straight or pistol handles?

Our preference is for the straight handle.

- A straight handle is virtually obligatory in the case of rotation-type instruments like the needle holder since the rotation wheel is meant to be positioned at that point where the movement is to begin and rotation is achieved by turning the entire instrument. It is not meant to itself rotate. Rotation of a pistol handle is not only awkward but also calls for space that during a complex intervention is not often available in the operating field.

- This is purely a matter of preference, as use of the pistol handle has become established practice and, in many cases, this handle is highly ergonomic in relation to the position of the hands and the surgeon in the operating field.

- The advantage of the CLICKLINE system is that it gives the surgeon freedom of choice and allows him to change components virtually instantly.

- Such freedom of choice includes the selection of ratchets and the traditional, more rigid laparoscopic handles preferred by some surgeons. This, however, has an adverse effect on the homogeneity of the instrument: the flexibility of the handle arms should correspond to the increased flexibility of the jaws achieved by lengthening, as is the case with conventional instruments.

Moreover, there is no doubt that in some cases locking by means of swinging ratchets or any other similar system is very useful, particularly if the instrument has to be passed to an assistant and the surgeon needs to have it at his disposal.
The insulated handles equipped with an HF coagulation system are attached to the scissors and are our standard. Coagulation through contact with the metal handle grips on the outside or the jaws on the inside, by means of the available HF system, seems to us to be the most practical method.

**One or two movable handle arms?**

For pistol-form handles, a single movable handle arm is an obvious necessity; the movable handle arm is, of course, meant for the thumb.

The sequence of movements for instruments with two movable handle arms used in conventional surgery prompted us to opt for two movable arms for the straight handles, but experience has shown that this choice is not necessarily well-advised for a laparoscopic instrument. Given the fixed point of the parietal passage as well as the fact that the instrument has just one movable jaw, two movable handle grips are neither necessary nor useful. On the other hand, we observed (to our surprise) that with just one movable handle arm, surgeons do not all use the same movements.

**Use of dissecting forceps**

Apart from the wide range of jaws available, the two basic characteristics of this type of forceps in “open surgery” are as follows:

- The forceps function in opposition to an opening spring, which ensures that they are always open and ready for grasping when they are free.
- The exclusively distal grip of the convergent jaws, even when in an open position, provides for extreme delicacy and selectivity of grip comparable to the “pincer” grip (between the tip of the thumb and the index finger). The grip produced by all other forceps is similar to the grasp of the entire hand (thumb held flat against the fingers) – a very powerful grip, but considerably less selective.
We have tried to achieve these two characteristics through the following instrument design:

- Addition of a removable spring, selected according to the type of handle.
- The “forcipressure”-type ratchet, which does not form part of the concept for the dissecting forceps, is not an obstacle, as it only comes into play with the application of additional “controlled” voluntary pressure. Rather, it permits a grip to be locked and handed over to an assistant so the surgeon can make another movement.
- The permanent convergence of the handle grips that is possible with conventional dissecting forceps, even in the open position, has yet to be recreated in a laparoscopic instrument. However, lengthening of the jaws and the delicacy of the distal grip represent a satisfactory approach.

N.B.: As each speciality has its limits (e.g., pediatrics – cervicoscopy – vascular surgery) and each surgery its preferences, the range of instruments is available in a number of lengths: long (43 cm), medium (36 cm, standard) and short (30 cm).

Customization of the handles

For this new set, we have created a number of handles with the aim of allowing all surgeons to experience details in as close as possible a manner to that of open surgery and to give each the chance to choose the handle that is best suited to their requirements and way of working.

It is thanks to the flexible CLICKLINE system that individual needs can be met.

We do recommend, however, the following combination which we feel best portrays the spirit of this instrumentation set:

- **Pistol handle with ratchet (Art. no. 33143).** This handle combines the “forcipressure” concept with the most commonly used handle in laparoscopic surgery into which all types of grasping forceps inserts fit. Indeed, some surgeons have become so accustomed to this type of instrument, which they encountered when they first began with endoscopic surgery, that it has become a piece of what is ‘traditional’.

- **Axial handles, short and long, with ratchet (Art. no. 33144/33145), or without ratchet (Art. no. 33144 F/33145 F).** As is true for the items mentioned above, these handles are highly versatile and employable with all forceps.
Their axial design reduces the space taken up by the instrument in the extra abdominal operating field and permits a return to more traditional surgical movements, with the inserts generally being attached at the axis of the handle.

- **The HF insulated handles, polyester (for pistol handle – Art. no. 33121) or coated steel (for the axial handle – Art. no. 33127) are the tools available which are suitable for use with the scissors. Here, unlike in the preceding cases, it is the stiffness of the jaws that is the desired option.**
  - Short or long? The choice is yours! Given that they both have the same spring and that the lever arm is different in each of the two cases, the opening force will be lower for the longer handle. We therefore recommend the latter for use with the needle holder, for which it increases the precision of the movement.
  - Opening spring? The use of an opening spring also comes down to personal taste. Please bear in mind, however, that the opening spring is intended to provide the instrument with a similar function to that of dissecting forceps.
  - With or without ratchet? When the instrument is used as dissecting forceps, the ratchet is not required. Yet for laparoscopic movements where one is attempting to limit the substitution of instruments as far as possible, it allows the transformation of dissecting forceps into classic grasping forceps as required.

Two specific instruments are presented in the appendix to this instrument guide.

**Needle Retractor**

- No trocar is necessary (it acts as its own trocar).
- Once inserted in the cavity, the sharp stylet is replaced by a non-aggressive blunt trocar.
- It can be used as an additional retractor as soon as this is practical. Due to its diameter, puncture does not cause parietal lesions or leave any visible scar. It can thus be used without any reservations.
- Besides its function as a palpation probe-retractor – an instrument with a long tradition in the field of laparoscopy – this instrument can occasionally also do service in somewhat unexpected ways. For example, it can be used as an autostatic retractor or as a separate irrigation cannula, permitting, for example, simultaneous suction and lavage.
Two-valve speculum, a reworked version of an existing instrument which we have equipped with a rim to prohibit underlying tissue from slipping down the valves. To ensure the opening is sufficiently large, we have considerably lengthened the opening section of the handle grips.

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MOURET Dissecting and Grasping Forceps

CLICKLINE – rotating, dismantling, with and without connector for unipolar coagulation

Size 5 mm

Multiple puncture approach

Operating instruments, lengths 30, 36 and 43 cm, for use with trocars size 6 mm

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Single action jaws

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CLICKLINE MOURET Dissecting and Grasping Forceps, slender, long jaws

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CLICKLINE MOURET Dissecting and Grasping Forceps, distal micro serration, slender, long jaws
MOURET Dissecting and Grasping Forceps

CLICKLINE – rotating, dismantling, with and without connector for unipolar coagulation

Size 5 mm

Multiple puncture approach

Operating instruments, lengths 30, 36 and 43 cm, for use with trocars size 6 mm

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CLICKLINE MOURET Grasping Forceps, atraumatic, short and powerful jaws, with distal serration, fenestrated, slender

CLICKLINE MOURET Grasping Forceps, atraumatic, with distal serration, round jaws, slender, delicate grasping

CLICKLINE MOURET Dissecting and Grasping Forceps, fenestrated, slender, atraumatic
MOURET Needle Holders and Knot Tier

**33345 SK**

**CLICKLINE MOURET Needle Holder**, single action jaws, straight, size 5 mm, length 36 cm

- Metal Handle, axial, with hemostat style ratchet
- Metal Outer Sheath
- Needle Holder Insert

**33345 SR**

**CLICKLINE MOURET Needle Holder**, single action jaws, straight, size 5 mm, length 36 cm

- Metal Handle, axial, with hemostat style ratchet
- Metal Outer Sheath
- Needle Holder Insert, straight, jaws with groove

**33344 KM**

**CLICKLINE MOURET Knot Tier**, rotating, double action jaws, jaws with notch and without serration, automatic jaw closing with mounted Spring 33137 MF, closing Handle 33144 opens the jaws, size 5 mm, length 36 cm

- MOURET Metal Handle
- Metal Outer Sheath
- Knot Tier Insert
MOURET Laparoscopic Needle Retractor
for percutaneous use

MOURET Laparoscopic Needle Retractor,
size 2.8 mm, working length 30 cm, for percutaneous use
including:
Cannula, with Luer-Lock connector
Trocar only, with pyramidal tip and fixed handle
Trocar only, with blunt tip and fixed handle

MOURET 2-Blade Speculum

MOURET 2-Blade Speculum, working length of the valves
6 cm, outer diameter in normal position 12 mm, maximal
spreading 43 mm, with a distal rim to prevent tissue from
slipping
It is recommended to check the suitability of the product for the intended procedure prior to use.