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Editorial

Minimally Invasive Surgery: Mini or Mono? This Is the Problem!☆

La cirugía mínimamente invasiva: ¿mini o mono? ¡Esa es la cuestión!

About ten years ago—only ten years ago—running my first laparoscopic total gastrectomy I thought to myself: I don't know what I will be able to do of more innovative in my professional life.

Then, in a few years some previously unimaginable things, such as the laparoscopic pancreaticoduodenectomy, the Da Vinci robot, the transvaginal cholecystectomy, the SILS, come into our surgical practice.

In ten years, in only ten years, I have achieved various surgical goals, and I had to continuously measure myself with an evolution that gallops, and it is difficult to keep up.

And I wondered: where are we going?

In this context I would first analyze the various surgical approaches, to be able to do some reflection on the future.

With laparoscopic surgery we have reached a standard that, in many centers, it is perhaps superior to the traditional one, with all the countless benefits that this approach offers compared to traditional surgery, and that we are not going to repeat here. Undoubtedly, it took years and years of evolution, of sacrifice and courage to get to standardize the minimally invasive techniques.

But today, with such standardization, laparoscopic surgery has reached a high level of educational, surgical and professional excellence, and therefore the comparison with other types of mini-invasive approach has to be made on these standards.

Robotic surgery, instead, is a “niche” surgery for the chosen few among the surgeons and patients, being known the high cost of purchasing and management, and the few fields of secure and undisputed clinical application.

We acquired the Da Vinci robotic technology since 2002 and today, after a initial training in cholecystectomies later enlarged to other more difficult procedures, we believe that the real indications may be anastomotic reconstructions and some selected operations with small rather than large fields of dissection.

In our practice the Da Vinci is now used in the excision of the mesorectum, in the lymphadenectomy, in the achalasia and in some digestive or biliary anastomosis. In spite of this current limitation in clinical applications, today a great interest in the robotic approach is related to the ever-changing technology, with robots increasingly refined, easy to handle and, therefore, with an augmented potential of future applications.

About NOTES we observed a considerable interest starting from its birth up to a year ago, when it became progressively died/waned on the basis of insurmountable surgical, medical-legal and technological problems.

We were the first in Italy, and perhaps the second in Europe, to perform a trans-vaginal cholecystectomy, but today we also withdrew for the same reasons above mentioned.

I believe, however that clinical experiences with NOTES are still relevant to evaluate the effectiveness of channels combined with laparoscopy (hybrid procedures), and to grow in the concept of an ever less invasive surgery, but, in truth, the pure NOTES as such, is actually a little' aside.

In fact, an interesting development seems to have the choice of the NOTES for the extraction of the surgical specimen (bowel, spleen, stomach, etc.) through the vagina or rectum after a traditional laparoscopic procedure.

In my view, the real novelty in recent years, with possible larger future surgical implications, is represented by the SILS (monotrocar) and by minitrocar surgery.

Mono or mini? This is the problem!

It is obvious that we talk about small progress compared to traditional laparoscopic surgery. In fact, the huge mediatic, scientific and professional impact, set in motion 20 years ago by laparoscopic surgery is unlikely to be renewed at least in the short term. The “French Revolution” was a real revolution in surgery and it is difficult to imagine another of same magnitude, after a so short time from the first.

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We must and we will make further progress that will bring additional benefits, but I think they will be minimally compared to those brought by laparoscopic surgery with respect to the open.

The concept behind, is always of lower parietal invasiveness. Starting from this concept, and after more than a year of personal experience, I'm still to understand what today is better and what is the future. It is better to have a "small" incision of 2 cm or smaller incisions of 2-3 mm? The surgical procedure is more efficient, faster, less burdened by complications, and a more aesthetic surgery is possible with the mono or the mini approach?

Undoubtedly, both have advantages and are open to criticism in relation to traditional laparoscopic surgery. But beyond the two options, a concept must be stressed in no uncertain terms: surgery should remain the same, the surgeon must operate with the same steps, with the same exposure and with the same rules of laparoscopic surgery.

The monotrocar surgery has three drawbacks: cost of "device", no divergence of the tools with important learning curve and, perhaps, the possibility of higher incidence of incisional hernia.

It is obvious that it requires a significant learning curve and it is important that, at least in the early stages, the approach should be used and improved in centers of excellence in order to avoid an increase in bile duct lesions or specific complications.

There is, however, the great advantage that, when used in the umbilical scar, has an excellent cosmetic result and, above all, avoids the complications of insertion of other trocars (bleeding, hernias).

Undoubtedly, if we need to use a drain, we're going to frustrate some of this extraordinary effect of monotrocar technique. But the major limitation of this approach, in my view, is when it is used outside of the navel (splenectomy, adrenalectomy, antireflux plastic, etc.), so losing most of its advantages.

And these cases reinforce my doubts: mono or mini?

Surgery with 2-3 mm minitrocars also has the problem of costs and easy wear of the instruments, and also that of few

instruments actually compatible with a 2-3 mm trocar. Lacks the ability to use clips, ultrasonic scalpel or radiofrequency, endobag, etc. On the other hand, in minitrocar laparoscopy, you have the opportunity to work with the same speed and effectiveness of traditional laparoscopic surgery, with minimal learning curve.

It is clear that we will need years to understand what is best, and surely we have to wait—as always—the prospective randomized trials.

The first data comparing the "traditional" laparoscopic surgery with the "monotrocar" one almost always show an overlap of results with no statistically significant differences.

How can I conclude in the light of my recent experiences?

Essentially I believe that today, if the surgeon must perform a "functional" operation (achalasia, hiatal hernia, prolapse of the rectum, etc.), it is probably better to work in mini, and where she/he should perform an excisional surgery (cholecystectomy, splenectomy, bowel resection) may prevail the concept of mono.

The development of robotic surgery applied to monotrocar could probably lead to a further step forward, allowing the ability to work in safety and greater comfort without sacrificing the concept of a less invasive surgery.

This association between robot and monotrocar is, in my opinion, the most interesting and possible progress for the near future, but probably, the high cost will lead to a slow diffusion.

For the moment we continue to run behind the technological innovations.

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