

INTERVIEW

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In conventional laparoscopic operations, the surgeon has to make several incisions into the abdominal wall to be able to insert the required instruments into the patient's abdomen – usually 3 to 5 incisions are needed per surgery. Now, a new surgical technique called *LESS* (Laparo-Endoscopic Single-Site) surgery enables doctors to perform complex procedures through one small single incision. If possible, the incision is made in the bellybutton so that the residual scar can be hidden and an almost scar-free cosmetic result achieved.

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1. Are there any additional benefits for the patients associated with the new LESS surgical approach besides the cosmetic one?

As you mentioned, the cosmetic benefit is obvious. But since, in *LESS* surgery, the number of incisions needed is reduced to only a single incision, the new approach is even less invasive than conventional laparoscopy, thus leading to further benefits for the patients.

Patients can expect to suffer from less pain and fewer complications in both the short as well as the long term. That means that the incidence of incisional hernia, incisional bleeding, internal lesions and local abscesses will be reduced. However, these are only potential benefits that still have to be proven by future randomised studies.

2. Whilst LESS surgery provides benefits for the patient, is it more difficult to perform for you as a surgeon?

In *LESS* surgery, we are essentially doing exactly the same operation that we would using the standard conventional laparoscopic approach.

In *LESS* surgery we do not change the surgical rules just because we are now going through a single site. The new surgical access does, however, require unfamiliar equipment that we have to handle differently. Therefore, a *LESS* surgery can be both different and more difficult. If, during *LESS* surgery, we feel that the degree of difficulty exceeds a reasonable extent and puts the patient at risk, then we do not hesitate to convert to the conventional laparoscopic procedure and put in additional trocars to finish the operation. That is a rare exception, though.

At our clinic in Geneva, for example, we have performed 161 *LESS* operations and in all of those cases we only had 2 conversions to the multi-port laparoscopic approach.

3. What are the indications for the LESS technique in general surgery?

In principle, in *LESS* surgery, we use exactly the same surgical procedure we would with the standard conventional laparoscopic approach. So, theoretically, *LESS* surgery can be employed for every standard laparoscopy approach in general surgery as well. The current range of indications that have already been performed successfully using the *LESS* approach is already very high, and I think it will expand even more in the near future. We currently perform appendectomies, cholecystectomies, inguinal as well as abdominal wall incisional hernia repair, and we have even performed right and left colectomies. If the development of technical equipment keeps on progressing, I do not see any reason why we should not be able to perform almost all the procedures we do with laparoscopy right now with *LESS* surgery. Technical improvements will define the future range of application for *LESS* techniques.

Maybe one day procedures like gastric bypass or small bowel resections that are still very challenging to do right now might become routine *LESS* procedures if the industry provides us with the appropriate instruments and cameras.

4. With a track record of 161 cases of LESS surgery in total, you and your team rank among the most experienced general surgeons in LESS techniques in Europe. Which surgical procedures have you performed with LESS surgery so far?

Our experiences with *LESS* surgery are very broad. The *LESS* procedures we have performed include:

29 appendectomies,
48 cholecystectomies,
17 ventral hernias,
15 incisional hernias,
4 right colectomies,
5 left colectomies, and
9 emergency procedures on perforated ulcers, for example.

5. The new method of access raises new challenges with regards to the surgical process in terms of limited space or triangulation, for example. What aspects should be considered when developing novel instruments for LESS procedures?

The instruments that are available right now already enable us to do safe *LESS* operations! However, technical optimisations and innovations will certainly facilitate our work as surgeons even further.

The most important aspect in developing new instruments is mainly manoeuvrability – which is crucial for us surgeons to perform surgery – and freedom of motion. In addition, further optimisation of the clinches that allow us to apply forces to the organs and of the camera systems will make a contribution to enhancing *LESS* surgery. My future vision is a camera that is totally different from current standard designs. It is a small camera that is

imported completely into the abdominal cavity and does not have any physical links with the outside. This would provide us with an inside view without occupying a port access. Ideally, the camera can be moved around inside the abdomen, thereby providing us with various perspectives of the abdominal cavity.

Technical improvements will strongly define the future of *LESS* surgery.

6. How do you evaluate the learning curve of LESS surgery as a new technical approach?

Like the procedure itself, the learning curve in the end also depends on the quality of the instruments and on the surgeon's ability to use them. We really greatly depend on the quality of the instruments we have and the ones you are providing us. Eventually, the surgical performance of *LESS* surgery as an advanced laparoscopic approach is the same as in conventional laparoscopy. Laparoscopic experience therefore shortens the learning curve tremendously.

I want to emphasise at this point that every surgeon performing *LESS* surgery should be well trained in this new field in order to provide patients with safe surgery. Several centres do organise courses for *LESS* surgery with hands-on practice. I strongly recommend the attendance of one of those courses prior to starting any clinical attempt. Tips and tricks as well as some rules will then be learned.

At this early stage of *LESS* surgery, we have to be very careful, since every careless mistake could have devastating consequences.

Unfortunately, we have experienced the extent to which such incidents can happen in the field of robotic surgery in the USA. Here, wrong manipulation of the robotic instrumentation led to the death of a patient and cast a damning light on the entire innovative surgical approach. Everybody has been talking about this dramatic accident.

We should learn from this and should be very careful in establishing *LESS* surgery.

7. Where do you see the future of LESS surgery?

I see it everywhere! I think *LESS* surgery has great potential and is clearly here to stay. It is not just a short-lived, temporary surgical idea. *LESS* surgery is a truly innovative surgical approach that is beneficial for the patients and has already proven its feasibility. I think that *LESS* surgery will relatively quickly establish and expand its foothold in various fields of minimally invasive surgery.

I think *LESS* surgery will also pave the way for the development of NOTES (natural orifice transluminal endoscopic surgery).

LESS surgery is the step that we have to take before we succeed in NOTES. The indications in *LESS* surgery are closely coupled to the indications for NOTES, especially where the transgastric approach is concerned. Experiences and developments achieved in connection with *LESS* surgery will help establish safe transgastric NOTES techniques. Many of the *LESS* procedures will, though, remain for a very long time and coexist alongside NOTES, especially in complex procedures like gastric bypass or bilateral surgery. *LESS* surgery is here to stay – for a quite long time!!!!

8. Do you think patients' demand will rise in the future?

Yes, I think more people will be asking for *LESS* surgery in the future. Fast-rising demand can harbour jeopardy, though. I think we have to be careful because the patients putting pressure on the surgeon in this way can be the wrong type of motivation. I think the surgeon should – at no point – be driven by the patient to perform a *LESS* operation. It should always be the doctor who validates which surgical procedure is the most appropriate. Otherwise, surgeons who are not trained properly or who are not even experienced in conventional laparoscopy might start performing *LESS* operations which could lead to fatal results.

9. How might we counteract the pressure arising from a growing patient demand for LESS surgery?

We should get ahead of this. We should try to progress in this new field quickly enough so that we are ahead of patients' expectations.

Safety always has to remain our highest priority. Surgeons should always be trained accurately in *LESS* theory, and should gain as much hands-on experience as possible. Therefore, we are thankful that Olympus strongly supports and collaborates with us surgeons to set up training courses where we can share our experiences.

10. Are there any contraindications for LESS surgery, like obesity?

The most obvious contraindication, as with every surgical approach, is when the patient does not agree to the surgical procedure. But that is very unusual. In Geneva, we had just one patient who refused *LESS* surgery for whatever reason. Another contraindication that prevents us from operating with *LESS* surgery is patients with several previous surgeries. Due to their anatomical condition, we start right away with a standard laparoscopic approach. In its early stages of development, we do not want to jeopardise the *LESS* technique unnecessarily risking complications that are basically linked to the patient's anatomy.

Obesity, in contrast, is not a contraindication for *LESS* surgery. Quite the contrary:

Many indications that are especially suitable for *LESS* surgery, like cholecystectomies or incisional hernias, have the highest performance rates in obese patients. When a cholecystectomy is indicated in obese patients, I would primarily choose the *LESS* approach because it prevents the post-op complications associated with the multi-site approach.

11. What do you tell your patients when informing them about their upcoming LESS surgery?

Especially in the field of technical innovation it is important to provide the patient with as much, and as detailed, information as possible.

During our preoperative consultation we try to inform the patient about the differences between LESS surgery and the conventional laparoscopic surgery – in matters of risks, benefits and the surgical procedure. Thereby we try to go into the differences concerning him as a patient as well as the ones that face us surgeons. If necessary, we explain on the basis of illustrations or the instrumentation like the multiple-port of the hand instruments.

It is also important to always explain to the patient that if complications occur during the surgery the surgeon might have to convert to the conventional laparoscopic approach or even an open approach during the surgery due to safety aspects.

As a basic principle we are always honest, but try not to give the patient cause for concern.