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Editorial

Single Port, NOTES: A Promising Future or a Passing Fashion[☆]

NOTES, puerto único: una promesa de futuro o algo pasajero

It is much easier to develop new technologies than to convince surgeons of their systematic application. It is a fact that this principle has been and continues to be the case in various fields of surgery, and that the clearest example of this is the development of laparoscopic surgery in the past. The journey that this type of minimally invasive technique had to take to become a universal approach for certain procedures was laborious, time-consuming and tedious before the surgical community finally accepted its systematic implementation. And, could it be possible that natural orifice transluminal endoscopic surgery (NOTES) and the development of single port surgery (SP) are benefiting from this initial rejection of laparoscopy? Could it be that surgeons wish to avoid the mistake of closing their doors to technological breakthroughs such as these? Naturally, only time will tell.

In 1998, with the development of mini-instruments as supplements to or substitutes of the laparoscopic approach, which had already been established in many centres, Unger et al.¹ published an article in which they stated that “smaller is better”, in reference to the possibility of making smaller incisions, of 2 mm and 3 mm, which could be related to a decrease in pain for the patient, while providing better cosmetic results, with similar operating times to those of the conventional laparoscopic approach. Berci's² response in a letter to the editor was that “smaller is not necessarily better,” saying that it was not necessary to promote this variant of the laparoscopic approach since it did not have any significant advantages.

NOTES and SP are other minimally invasive techniques that have arrived, and this scientific-intellectual discussion on mini-laparoscopy that was published in 1998 in *Surgical Endoscopy* becomes very important when we analyse the future of these new technological contributions today. If we analyse the intrinsic concept of minimally invasive surgery, we can define it as a *safe and effective procedure that is performed with a minimization of the collateral damage required to reach the area to be operated on*, leading to a potential reduction in the size

of the optics and instruments for surgery with the same safety and effectiveness. For this reason, perhaps the concept advocated by Unger that “smaller is better” can be upheld. But what is striking is that the development of mini-instruments was not that which was expected and it was internationally abandoned since 2000, with the exception of certain working groups such as ours, which have carried out many procedures with these mini-instruments. However, the need to develop NOTES and SP has led us to hybrid procedures combining these approaches with the use of laparoscopy as we know it,³ thus promoting the use of mini-instruments and relaunching interest in it.

This preliminary analysis summarises SP and NOTES and what they may become. We will simply bring an open mind to combine the technological innovations around us in order to be more effective at what we are treating: the concept that has come to be known as *hybrid surgery*. However, despite technological progress, we cannot only remain highly skilled. We are aware that we must put the principles of being *extremely academic* before this eagerness to be *extremely skilful*. Training, a simulator, the development of a case, a clinical trial and series to demonstrate the advantages, just as the EAES announced in its recommendations in *Surgical Endoscopy* in 2010,⁴ and McCulloch et al., in *Lancet* in 2009.⁵ This must be the right path to follow and perhaps those who do not follow it and are not involved in this form of development are not on the right track. If we begin to look at what is happening internationally in this field and visit the *clinicaltrials.gov* website, we can see the number of groups, which with good scientific criteria, are conducting different clinical trials to attempt to show the advantages and cost-benefit of new procedures such as SP or NOTES. Criticising or attempting to interrupt these trials simply because we believe, and this is not science, that one method is better than another, is not good for the development of the scientific world, neither as surgeons nor as individuals. Logically, this should be the path of groups that innovate, since they allow us to move towards a better

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world. Experimental studies,⁶ series of cases with reliable and safe criteria,⁷ systematic revisions,^{8,9} registries such as the national registry of the Spanish Association of Surgeons for SP,¹⁰ and analysis of the progress carried out¹¹ should be undertaken in order to analyse the information that we require and the direction these clinical trials should go to in order to scientifically demonstrate the advantages associated with this new way of approaching the abdominal cavity.

But there is a series of aspects that should be analysed in line with this framework. On the one hand, it is necessary to establish whether, in implementing these new approaches, we are performing a minimally invasive technique with the same safety and effectiveness¹² employed in the conventional laparoscopic approach, which is fast, very safe and yields excellent results and is difficult to surpass. We must not forget that the laparoscopic approach, while it was attempting to become established, *struggled* against the large incisions of the laparotomy approach, which was easy to surpass in terms of the benefits that laparoscopy brings with regard to decreased pain and complications associated with laparotomy wounds, which are elements that do not exist in the step from laparoscopy to NOTES or SP, and this will certainly hinder its general application. Nevertheless, laparoscopic procedures that require a minilaparotomy, such as for the colon, may perhaps benefit from these methods, since these incisions can be avoided completely, as is the case for NOTES, or may be minimised or implemented in a more functional manner, which occurs with SP.

Furthermore, we must analyse whether the procedures via NOTES breach the basic principle inherent to any minimally invasive procedure. We must be critical and judge whether or not we are overstepping the minimal invasiveness boundaries, whether or not we are increasing the collateral damage required to access the operational area, i.e. if perforation of the vagina, stomach or colon is safe and is producing more collateral damage than the creation of a small periumbilical incision to extract the surgical instruments. We do not have the scales to measure each effect of our invasion of the cavity through these natural orifices dependent on the size of the surgical instrument, the age of the patient, the orifice to be perforated, etc. Perhaps scales in the future will tell us that performing a NOTES-assisted transvaginal cholecystectomy on a patient of 30 years of age is not indicated, but that there are major advantages to performing a NOTES-assisted transvaginal splenectomy on a multiparous patient of 60 years of age. All this means that it is necessary to discuss and carry out a critical analysis on the best indications for these procedures.

Another issue of greater concern is whether the development of these new procedures will result in a rise in the dreaded learning curve. Sir Alfred Cuschieri, during one of his lectures at the beginning of this century in the EAES congress in Nice, argued that the learning curve was unacceptable as there were centres of excellence in laparoscopy, and beyond the ego of the surgeons, training was required. What we are considering for NOTES and SP, which are still very young techniques, is how can this learning curve be avoided? The truth is that the implementation of the new procedures associated with technological developments has changed and quality controls have increased. We must be serious about what we do, and we believe that we must abandon the

principles of favouritism and the egos of surgeons in order to ensure successful implementation of these technologies. Registries, clinical trials, training courses and humility are the principles of this development.

Finally, we see now how it is undeniable that the real contribution of NOTES and SP is the technological progress that they are driving forward. The use of mini-instruments has been relaunched and ground-breaking systems will be developed to reduce damage of the abdominal wall, the use of magnets and percutaneous instruments to replace support trocars needed for traction and countertraction in the laparoscopic approach. And it will certainly boost the development of flexible endoscopy with wireless cameras that are more ergonomic both for the surgeon and for the gastroenterologist performing endoscopy. All this has resulted in the development of new, safer methods of suturing, triangulation, traction-countertraction, and the miniaturisation of energy sources, methods, haemostasis, etc. will be boosted.

And all this should be viewed within the framework of the social context in which we work today: firstly, the global financial crisis which is stifling us, where the principles of the cost-benefit ratio must be assessed and, secondly, the patient's wish for reduction in pain and suffering, which promotes the development of minimally invasive techniques.

I believe that, whatever happens in the future, we must first thank NOTES and SP for boosting technological development, from which we will no doubt benefit one way or another, and the future will tell if they are here to stay, fully or partially, or if they will be temporary and will remain as such in the history of medicine.

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Salvador Morales-Conde

Unidad de Innovación, Unidad de Innovación en Cirugía Mínimamente Invasiva, Hospital Universitario Virgen del Rocío, Sevilla, Spain

E-mail address: smoralesc@gmail.com

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