

Laparoendoscopic Single Site Surgery (LESS) – Is it a bridge to Natural Orifice Translumenal Endoscopic Surgery (NOTES) or the final evolution of minimally invasive surgery?



“To open the abdomen is always mortal”

Hippocrates 380 a.C.

Evolution of Medicine and surgical techniques allowed us to disagree with the well-known Hippocrates quote mentioned above. Even before the advent of laparoscopy, abdominal surgeries have been performed with safety and efficacy for years. During the last three decades the advent of laparoscopy has revolutionized the surgical treatment, which makes unquestionable the benefits of this approach. Some procedures that were considered impossible to be performed via laparoscopic approach are now performed without using extensive incisions to solve it. The evolution of surgical techniques, instruments and training of surgeons not only developed the laparoscopic approach but also modify the way of surgically treating diseases localized in different parts of the organism – thorax, abdomen, pelvis – in such a speed we have never seen before in the history of surgery. In order to exemplify the success of this approach, only four years after its description the laparoscopic cholecystectomy was the approach of choice in 80% of the surgical services in the United States.

The secondary benefits of this new approach, such as decreased postoperative pain, reduced

inflammatory response, prompt return to daily activities, reduced complications of surgical wounds (infections and incisional hernias) among others which were extensively depicted in scientific researches accomplished worldwide. However, human beings by nature (specially the surgeon) are not satisfied with what has been currently used, and an eager desire to improve our current condition is what propels us, even if it is quite safe and accurate as it is nowadays the laparoscopic surgery. From this point of view, new alternative methods have been suggested to minimize the already small surgical trauma in laparoscopy.

The reduction of the diameter of surgical instruments, for 2 and 3mm tools, precociously emerges as a factor to decrease the aggression to the abdominal wall. The low resistance and frequent breakage of the available laparoscopic devices restrained the initial enthusiasm for their use, with its recent recrudescence with the development of new resistant metals and the possibility to use of these devices in other less invasive technique such as laparoendoscopic single site surgery (LESS) and Natural Orifice Translumenal Endoscopic Surgery (NOTES).

The use of natural orifice in order to minimize surgical traumas was first demonstrated in animals in 2004. However, the interest in this technique increased

after the first case in human beings was performed in India, which depicted a new era of minimally invasive surgery could be achieved: an incisionless surgery in which the surgeon has access to intracavitary structures (thorax, abdomen, and pelvis) after intentionally breaching a hollow viscus. The paradigm shift is evident: what was a complication of an operative/endoscopic procedure (breach of a viscus), now is considered not only a common procedure but also a desirable one. Nevertheless, this technique should supplant a number of questionable thoughts that still could not be answered. To define the role of breaching a viscus(essential to perform the procedure) as a factor of serious complications, such as sepsis and the development of digestive fistulas is a task which is not possible to be currently performed and perhaps the main question to be answered. The possibility to invalidate a potentially beneficial technique explains why the United States has performed only one hundred cases in human beings since the beginning of the research in this area(the same four years in the course of the beginning of the laparoscopic surgery approach and its acceptance as a technique of choice) and the global worldwide casuistic is around 1500 cases, with a great number of "hybrid" cases(with mini-laparoscopy and laparoscopy subjects), data were reported in the Society of American Gastrointestinal Endoscopic Surgeons (SAGES) in April of the current year.

In this context, it seems reasonable to determine similar alternatives to the NOTES concept (minimally invasive procedure, single port, multiple instruments through the same access port), without nevertheless observing the complications of the breach of a viscus. Laparoscopic ports assembled in one single site incision, either through special devices (single ports) or through separate incisions in the aponeurosis (single incision concept) emerges as a reasonable alternative to traditional laparoscopic procedures and to NOTES. As it is performed with adapted laparoscopic instrument (eventually articulated devices

which allowed its greater mobility when it is inside the cavity), cause this alternative to be more pleasurable to the laparoscopist than the flexible endoscopic devices necessary(at least in the current stage of the development of instruments) to perform NOTES. A great number of surgeons considered that an intermediary stage between the traditional laparoscopic surgery and the natural orifices surgery is necessary to obtain a satisfactory training in order to perform procedures exclusively via transluminal in the future.

If we critically analyze the necessary background to train a NOTES surgeon, it will be observed that knowledge and experience in advanced laparoscopy and endoscopy are essential which nowadays are not achieved by the majority of the surgeons during their training. Definitely, LESS surgery is much closer to the concept of traditional laparoscopy (which is routinely taught in most of the surgery internship programs) than NOTES, as it can be more naturally accepted by the surgeon than the necessity to develop a new ability that is not in his routine, we wish LESS does not only become a bridge to the development of transluminal surgery, but also that a vast number of surgical problem may be solved. Needless to say that science will convey if this approach is superior or equivalent to the traditional laparoscopic surgery, to the minilaparoscopy and to NOTES. Only time and strict scientific research will bring the answer.

What we can not do is not searching the answers for the questions above. If nothing is done we will incur in the same mistake which the legendary figures of the medicine, such as Jean Nicolas Marjolin, who in 1828 uttered that: "Surgery has reached such level of refinement that we cannot wait for any improvement". We have to analyze with critical sense our desire for minimal invasive approach in order to transform it into benefits to our patients and to help us safely define the best approach to be used in each case.

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