

Pros and Cons

Scarless surgery is the Holy Grail of surgery and the very raison d'être of Minimal Access Surgery was the reduction of scars and thereby pain and suffering of the patients. The work of Muhe and Mouret in the late 80s, paved the way of mainstream laparoscopic procedures and it rapidly became the method of choice for many intra-abdominal procedures⁸. Single-incision laparoscopic surgery is a very exciting new modality in the field of minimal access surgery which works for further reducing the scars of standard laparoscopy and towards scarless surgery. NOTES was developed for scarless surgery, but did not gain popularity due to a variety of reasons. NOTES stands for natural orifice transluminal endoscopic surgery, a term coined by a consortium in 2005. NOTES remain a research technique with only a few clinical cases having been reported. The lack of success of NOTES seems to have spurred on the interest in single-incision laparoscopy as an eminently doable technique in the present with minimum visible scarring, rendering a scarless effect⁹.

Laparo-endoscopic single-site surgery (LESS) is, a term coined by a multidisciplinary consortium in 2008 for single-incision laparoscopic surgery. LESS seems to offer an advantage to surgeons with its familiar field of view and instruments similar to those used in conventional laparoscopy. LESS remains an evolving special technique used successfully in many a centre, but with a significant way to go before it becomes mainstream. It currently stands between standard laparoscopy and NOTES in the armamentarium of minimal access surgery. This article outlines the development of LESS giving an overview of all the techniques and devices available and likely to be available in the future.

Single-port laparoscopy is not new. It had been around for more than 30 years. The gynecologists were doing tubal ligation with a single-puncture laparoscope since the late 70s. This technique works well for gynecological surgery as well as the uterus can be manipulated from below. Appendectomy have been done with a single puncture as early as 1992¹⁰. In this technique the appendix is coaxed out of the umbilicus to complete the task after caecal mobilization. More recently this has been described with transumbilical flexible endoscopy.

The use of multiple trocars rapidly gained popularity over the disadvantages of a single puncture. As conventional laparoscopy became popular even for complex procedures in surgery, it was usually carried out through four or more parts.

Increasing the number of ports led to reduced cosmesis, more pain and increased risk of complications due to port site infections and hernias. One advantage of reducing the number of ports over cosmesis would be to reduce these complications. The minimal access surgical techniques have come a full circle with the single-incision surgery gaining popularity once again. Furthermore, single-port/single-site surgery may be a closer step towards that elusive goal of NOTES.

Conclusions

Historically, invasive, large incisions were necessary to perform "open" abdominal surgical procedures. While effective, this method increased the possibility of multiple complications, including post-operative pain, wound infection, incisional hernia and prolonged hospitalization. Concerns over the rate of complications and morbidities led surgeons to develop laparoscopic surgical techniques, in which operations in the abdomen are performed through small incisions-usually 0.5-1.5 cm-as opposed to larger, open incisions across the surgical site.

Single-port surgery has left its mark in minimal access surgery and has been adopted by some centers with very good results for all kind of intra-abdominal surgeries. All the initial studies show it to be feasible, reasonably safe and cosmetically advantageous to conventional laparoscopy. Obviously one would not see a stark benefit as one did between open surgery and laparoscopy when it first began. It will no doubt be spurred on by rapid advances in technologies and better instrumentation that is likely to follow. Experienced laparoscopic skills are obviously needed to accomplish safe single-port surgery. The cost factor, given the access devices and other instrumentation, is significantly more as are the learning curve and operative times. Of course, the cost would be negated if one used the SIMPLE technique and standard laparoscopic instruments, but the other problems remain. Open surgery had a wide incision that accommodated the surgeon's hands. Laparoscopy with its tunnel vision took away the space for the hands but added triangulation to make up for the loss of direct access.

Single-port has taken away the triangulation from laparoscopy but MAGS technology may reintroduce this triangulation, although intra-abdominally, to make up for the deficiency. With minimal access surgery changing at a rapid pace, only longer follow-up and controlled randomized studies will tell single-incision laparoscopy is a meaningful and lasting technique or a stepping stone towards a truly scarless intervention.

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