

*Editorial*

# Modern Concepts Applied to Endoscopic Surgery, Imaging, Minimally Invasive Technology and Therapy in Gynecology

Andrea Tinelli<sup>1,\*</sup><sup>1</sup>Department of Obstetrics and Gynecology and CERICSAL (Centro di Ricerca Clinico SALEntino), “Veris delli Ponti Hospital”, 73100 Lecce, Italy\*Correspondence: [andreatinelli@gmail.com](mailto:andreatinelli@gmail.com) (Andrea Tinelli)

Academic Editor: Michael H. Dahan

Submitted: 29 September 2022 Revised: 11 October 2022 Accepted: 12 October 2022 Published: 13 March 2023

In the last century, gynecological surgery made use of traditional abdominal and vaginal techniques, which allowed the performance of complex surgical interventions without the benefit of technology.

There was an extraordinary change near the end of the 20th century, with the appearance of technology, cameras, monitors and personal computers (PCs) in the operating room.

The gynecologist suddenly found her/himself having to change mentality, facing 4 distinct ways to perform a gynecological intervention: abdominal, vaginal, laparoscopic and hysteroscopic.

This has led to a radical change in surgical instruments, no longer traditionally composed only of forceps and needle holders, but of increasingly precise and miniaturized instruments.

Endoscopy has increasingly taken hold in daily diagnostic and therapeutic activity, becoming an integral part of all surgical specialties and is now a standard approach in numerous fields of surgery [1].

It has been a while since Kelling, the first to describe the basic principles of endoscopy of the abdomen [2–5], has joined with Raoul Palmer in Paris and Kurt Semm in Kiel [2] to become historic leaders in the field of surgical endoscopy in gynecology.

Recently, the industry has taken over the traditional school of surgery, with an increasing number of complex surgical procedures being performed by the laparoscopic approach. Younger physicians take laparoscopy for granted, including robotic-assisted surgery.

With the addition of artificial intelligence and augmented reality in endoscopy [6–8] along with an exponential growth of PCs in the operating room, a major increase in the complexity of the instruments has occurred.

Diagnostic accuracy has taken advantage of these enormous technological benefits, combining the precision of scanning, the three-dimensional reconstruction and the automation imposed by computer image processing programs.

Surgical simulators have reached levels of accuracy and reality that assist in the surgical training of new gynecologists in the modern operating room.

It was the British urologist John E.A. Wickham who first used the term “minimally invasive surgery” in the mid-1900s, publishing his visions about endoscopic procedures in 1987 in the British Journal of Urology [9].

The introduction of Minimally Invasive Technology and Therapy in gynecological practice is one of the greatest success stories in the history of this specialty. This historical overview shows that Minimally Invasive Technology and Therapy has developed at an incredible pace in the last two decades and created unprecedented opportunities in gynecology [1].

Currently, each surgical therapy is evaluated by the patient in terms of physical satisfaction, faster recovery, shorter hospital stay and restitutio ad integrum, with resumption of work and family life.

In order to acquire the necessary surgical skills to be able to use all the instruments of endoscopic surgery, a long learning curve is required, which arises from traditional surgery and then develops into minimally invasive surgery.

Young people who are confronted with these problems must be aware that their career requires appropriate time to acquire the surgical skill. A continuing problem is the senescence of surgical instruments and the frequent change of technology and software.

In practice, every year there are technological evolutions that must be considered in the purchase (or, better, the rental) of endoscopic and minimally invasive instrumentation.

Video technologies, cutting and coagulation instruments, materials of use, insufflation and irrigation pumps, imaging softwares are constantly being improved.

This involves high costs and the need for constant technological updating.

It is necessary to move from a solid traditional basis to one of adaptability, practical intelligence and flexibility in using the tools. Being rooted in technology can result in having to stand still in the operating room due to malfunction of a machine.....But this is part of the game of the evolution of science and of the “homo surgeo” species, which Darwin described in the Notes on the evolution of species in 1800.....



Modern gynecological surgery would pose difficulties for many of the famous surgeons from the mid-1900s onwards, due to the complexity of a modern operating room, use of endoscopic and minimally invasive instruments, planning of interventions, surgical procedures and in the current minimally invasive diagnostic and therapeutic approach. These changes will continue to be a part of the evolution of science and technological innovation, always hoping to know how to approach a gynecological pathology even in times of war or famine, or when it is not possible to benefit from these diagnostic and therapeutic technological jewels.

### Author Contributions

AT wrote the manuscript. The author contributed to editorial changes in the manuscript. The author read and approved the final manuscript.

### Ethics Approval and Consent to Participate

Not applicable.

### Acknowledgment

Not applicable.

### Funding

This research received no external funding.

### Conflict of Interest

The author declares no conflict of interest. Andrea Tinelli is serving as one of the Editorial Board members/Guest editors of this journal. We declare that Andrea

Tinelli had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to Michael H. Dahan.

### References

- [1] Alkatout I, Mechler U, Mettler L, Pape J, Maass N, Biebl M, *et al.* The Development of Laparoscopy-A Historical Overview. *Frontiers in Surgery*. 2021; 8: 799442.
- [2] Schollmeyer T, Semm K, Schollmeyer M, Mettler L. Practical Manual for Laparoscopic Hysteroscopic Gynecological Surgery (pp. 3–11). 2nd edn. In Schollmeyer T, Mettler L, Rüther D, *et al.* (eds.) Jaypee Brothers Medical Publishers: New Delhi. 2013.
- [3] Kelling G. Über Oesophagoskopie, Gastroskopie und Koe-lioskopie. *Münchener Medizinische Wochenschrift*. 1902; 49: 21.
- [4] Hatzinger M, Badawi JK, Häcker A, Langbein S, Honeck P, Alken P. Georg Kelling (1866–1945): the man who introduced modern laparoscopy into medicine. *Urologe - Ausgabe A*. 2006; 45: 868–871.
- [5] Schollmeyer T, Soyinka AS, Schollmeyer M, Meinhold-Heerlein I. Georg Kelling (1866–1945): the root of modern day minimal invasive surgery. A forgotten legend? *Archives of Gynecology and Obstetrics*. 2007; 276: 505–509.
- [6] Alkatout I, Holthaus B, Wedel T, Mettler L, Ackermann J, Maass N. Entwicklung der minimal-invasiven Chirurgie in der Gynäkologie und Überwindung assoziativer Herausforderungen. *Der Gynäkologe*. 2018; 51: 737–743.
- [7] Alkatout I. An atraumatic retractor for interdisciplinary use in conventional laparoscopy and robotic surgery. *Minimally Invasive Therapy & Allied Technologies*. 2018; 27: 265–271.
- [8] Alkatout I, Mettler L. Hysterectomy A Comprehensive Surgical Approach. *Journal of the Turkish German Gynecological Association*. 2017; 18: 221–223.
- [9] Wickham JE. The new surgery. *British Medical Journal*. 1987; 295: 1581–1582.