

Commentary on the Current Status of Minimal Invasive Surgery

Georgios I. Tagarakis^{1,2*}, Nikolaos Geropoulos^{1,2}, Christos Voucharas^{1,2}, Fani Tsolaki^{1,2}, Ioannis Alexiou^{1,2}, Angeliki Vouchara^{1,2}, Ioannis Tagarakis^{1,2}

Abstract

Minimal invasive surgery has been continuously advancing during roughly the last three decades. Despite the cost of the related equipment and the often considerable learning curve, the advantages of a lesser perioperative pain and a of a better cosmetic result with comparable surgical- oncological outcomes have contributed to the dissemination of minimal invasive procedures in all surgical disciplines. The current commentary aims to highlight the basic points of comparison between open and minimal invasive surgery, focusing of the main advantages and disadvantages of each category.

Commentary

During the last few decades, there has been an important shift leading from traditionally established surgical procedures toward less traumatic, minimal invasive ones. This shift has followed a related progress in technology and has affected all surgical disciplines, with the most prominent paradigms being:

- i. Laparoscopic surgery for practically every pathology within the abdominal region (hernia repair, cholecystectomy, appendectomy, colectomy)
- ii. Minimal invasive laparoscopic or robotic-assisted procedures in the disciplines of urology-gynecology (prostatectomy, hysterectomy)
- iii. Video-assisted thoracic surgery for a great variety of pulmonary-thoracic procedures, including lobectomy for lung cancer
- iv. Minimal invasive procedures for valve replacement/ correction in cardiac surgery
- v. A variety of arthroscopic procedures in the field of orthopedics (e.g., meniscectomy)

The generally acknowledged advantages of using minimal invasive procedures can be summed up to the following:

- i. Minor surgical incisions and minor wound surfaces that are associated with less pain and a more rapid mobilization
- ii. A smaller incidence of wound-related complications (wound infections, wound dehiscence)
- iii. A better cosmetic result
- iv. Better visualization of the operating field through the application of high resolution imaging equipment
- v. The annihilation of the natural tremor of the surgeon's hands which is electromechanically regulated in cases of robotic-assisted procedures.

Affiliation:

¹Department of Cardiothoracic Surgery, Aristotle University of Thessaloniki, Greece

²Postgraduate Master's Programme: "Health and Social Care Services Management", Aristotle University of Thessaloniki, Greece

*Corresponding Author

Georgios I. Tagarakis, Department of Cardiothoracic Surgery, Aristotle University of Thessaloniki, Greece and Postgraduate Master's Programme: "Health and Social Care Services Management", Aristotle University of Thessaloniki, Greece

Citation: Georgios I. Tagarakis, Nikolaos Geropoulos, Christos Voucharas, Fani Tsolaki, Ioannis Alexiou, Angeliki Vouchara, Ioannis Tagarakis. Commentary on the Current Status of Minimal Invasive Surgery. Archives of Clinical and Medical Case Reports. 8 (2024): 40-41.

Received: January 21, 2024

Accepted: January 06, 2024

Published: February 29, 2024

The main disadvantages of minimal invasive procedures include:

- i. A significant learning curve is often necessary
- ii. A significant cost for the purchase of basic equipment and consumables is necessary
- iii. Depending on the procedure, a more or less frequent conversion to open surgery takes place; this is associated with augmented risk for the patient and a significant stress for the surgical team.

In order to stress out some of the advances in the field of minimal invasive surgery, we are highlighting some epidemiological data:

- i. A total of 15.2 million laparoscopic procedures (cholecystectomy, nephrectomy, bariatric surgery, anti-reflux surgery, colectomy, appendectomy, inguinal hernia repair, and hysterectomy) were globally performed in 2023 [1].
- ii. In Japan, during the year 2018, the number of lung cancer operations using video-assisted thoracic surgery (VATS) was 34,249 and accounted for 75.7% of the total operations (n = 45,243), whereas that of pneumothorax-related operations using VATS was 14,379 and accounted for 97.6% of the total operations (n = 14,731) [2].
- iii. Already in 2009, the number of laparoscopic colectomies

had exceeded the number of the open procedures in the U.S, reaching the percentage of 51.3% [3].

Overall, it is generally accepted that with indications that are well kept within the official guidelines, minimal invasive procedures have good results with a lower overall cost due to the fact that the equipment expenses are outbalanced by the shorter ICU and overall hospital stay because of the lack of pain and the prompt mobilization of the patient. An extra issue that needs to be addressed is the necessity of the training of young surgeons in both techniques. We should move forward with the modern skills, we should however not forget to perform open surgery which may be the solution in cases of emergency, necessity of open transversion and conditions of extremity (financial crisis, war zones, mass destructions).

References

1. <https://idataresearch.com/>
2. Committee for Scientific Affairs TJAfTS, Shimizu H, Okada M, Toh Y, Doki Y, Endo S, et al. Thoracic and cardiovascular surgeries in Japan during 2018: Annual report by the Japanese Association for Thoracic Surgery. *Gen Thorac Cardiovasc Surg* 69 (2021): 179-212.
3. Moghadamyeghaneh Z, Carmichael J C, Mills S, Pigazzi A, Nguyen N T, Stamos M J. Variations in laparoscopic colectomy utilization in the United States. *Dis Colon Rectum* 58 (2015): 950-956.