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Editorial

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Mininvasive surgery in abdominal wall repair: lights and shadows

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The field of abdominal wall hernia surgery has seen a rapid evolution over the past few decades. This evolution has significantly benefited from the introduction of new techniques and materials that have markedly improved patient outcomes. A prime example of this evolution is the transformation of surgical techniques for inguinal hernias through the concepts of "tension-free" and "sutureless" methods. Traditionally, inguinal hernia repairs involved suture techniques that created tension on the tissues, increasing the risk of recurrence and postoperative pain. With the introduction of "tension-free" methods, such as the Lichtenstein technique, it became possible to use prosthetic meshes to reinforce the inguinal canal wall without tension. These methods dramatically reduced the recurrence rate, which had been the primary problem in hernia surgery up to that point. The subsequent introduction of "sutureless" techniques further improved outcomes by reducing tissue trauma and postoperative pain, thereby accelerating recovery times. Today, the advent of minimally invasive surgery has shifted research focus to other critical aspects beyond recurrence. These include chronic postoperative pain, seromas, costs, and hospital stays. These new goals and resulting new techniques aim to further enhance patients' quality of life and optimize healthcare resources, marking a new era in anterior abdominal wall hernia surgery. However, we must critically assess whether this is always the case.

It is essential to identify the appropriate surgical indications and carefully evaluate the risk-benefit ratio of well-established techniques. This approach minimizes complications and ensures genuine patient benefits.

For example, according to the European Hernia Society (EHS) guidelines, the primary indications for the transabdominal preperitoneal (TAPP) approach include recurrence after anterior access, as it allows access to a virgin plane and avoids re-implanting meshes and plugs in the internal inguinal ring, which can lead to often underestimated consequences. Bilaterality and intensive, consistent sports activity are also conditions where patient benefits outweigh the risks associated with abdominal procedures and general anesthesia[1].

Ventral hernia treatment, including both primary and incisional hernias, represents a significant challenge for surgeons. Following major abdominal surgeries, incisional hernias develop in 11%-20% of cases. In the United States, over 250,000 ventral hernia repairs are performed annually, with this number steadily increasing. In Japan, the number of ventral and incisional hernia repair (VIHR) procedures is also rising, with over 16,000 cases reported annually by institutions adopting the fixed payment system for medical expenses, according to surveys by the Hospital Intelligence Agency[2]. As with inguinal hernia repair, VIHR has transitioned from suture repair to the use of meshes. Recurrence rates for suture and prosthetic repairs in VIHR have been reported to be 46%-63% and 23%-32%, respectively. Since LeBlanc introduced laparoscopic VIHR (LVIHR) in 1993, this technique has gained popularity worldwide. Recent long-term follow-up series of LVIHR report a low recurrence rate of around 4.4%-4.7%. Additionally, a Cochrane review has demonstrated that LVIHR offers advantages such as a lower wound infection rate and shorter hospital stays compared to open VIHR (OVIHR)[3].

The technological advancements in VIHR have led to significant progress in prosthetic materials suitable for intra-abdominal introduction. The introduction of new meshes, often praised as perfect - anti-adherent, anti-decubitus, resistant, biocompatible, *etc.* - has effectively led to real anarchy in abdominal wall surgery (AWS) within a few years[4]. One of the principles of AWS dictated by masters in the field, Rives and Stoppa, is: "Never subcutaneous meshes because they are prone to infection and rejection and above all never IPOM one because it creates visceral catastrophes". Techniques such as Intraperitoneal Onlay Mesh (IPOM) and its evolution, IPOM+, despite using these new materials, have been responsible for abdominal disasters such as bladder migrations, complex adhesion syndromes leading to small bowel obstructions, bowel mesh erosion, and parietal abscesses.

This raises questions about the true minimally invasive nature of this surgery, considering that the mesh implantation site makes the treatment highly invasive. Implanting these meshes can endanger patients' lives or cause temporary disabilities, such as colostomies or ileostomies, despite being promoted as innovative technologies and minimally invasive treatments. Furthermore, catastrophic complications often go undetected during follow-ups, which are too short to identify issues that may emerge even decades later. Therefore, it is crucial to ensure that a good intraparietal procedure does not become a bad intra-abdominal one, nor convert a "wall blemish" into a "true abdominal one"[5].

It is also essential to question whether it is appropriate to subject elderly patients with multiple comorbidities to the risks of significant anesthetic complications associated with general anesthesia. This aspect is often overlooked in the numerous studies present in the literature, but it deserves more careful analysis.

In the field of minimally invasive approaches, robotic surgery has garnered considerable attention as a valid alternative to laparoscopy. Noteworthy differentiators include the feasibility of suturing instead of using tackers, improved surgeon ergonomics, and a reduction in chronic postoperative pain. This approach introduces a paradigm shift, combining precision and adaptability, and has the potential to significantly transform the landscape of ventral hernia repair (Robotic VIHR), making complex procedures such as Rives

or Transversus Abdominis Release (TAR) feasible, which are otherwise impossible with laparoscopy[6]. However, it is important to consider the challenges related to costs, operative times (and consequently general anesthesia duration), and training requirements necessary to adopt this technology; these issues currently limit the broader dissemination of robotic surgery[7].

DECLARATIONS

Authors' contributions

Study conception and design: Corcione F
Data collection, draft manuscript preparation: Corcione F, Ruberto P, Magno G
All authors reviewed the results and approved the final version of the manuscript.

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All authors declared that there are no conflicts of interest.

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Consent for publication

Not applicable.

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