

Key Maneuvers and Tricks for Safe Laparoscopic Hernia Repair

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Abstract

The development of technical skills in laparoscopic/endoscopic repair of primary and incisional hernias requires specialized training from the surgeon.

The aim is to offer technical tools that facilitate the performance of a safe laparoscopic/endoscopic hernioplasty.

Keywords: Key Maneuvers; Tricks; Laparoscopic Hernia Repair

Introduction

The development of technical skills in laparoscopic/endoscopic repair of primary and incisional hernias requires specialized training from the surgeon that allows him to faithfully reproduce the steps of open surgery, respecting the principle of anatomical-functional repair of the abdominal wall, with equal and even lower rates of morbidity and recurrence.

During the last II Congress of the Hispano-American Hernia Society held in Madrid - Spain, May 2018, we presented the criteria of the so-called "Perfect storm in laparoscopic surgery for inguinal hernia" (Juárez Muas DM - Palmisano EM):

1. Surgeon at the beginning of his learning curve
2. Anatomical variants of the critical view of safety
3. Acute presentation
4. Recurrences
5. Poor quality of images
6. Inappropriate instruments/material
7. Night shift.

By focusing on the strictly educational aspect, we proposed a series of guidelines or postulates (Palmisano EM. XVIII Paraguayan Congress of Surgery, Asunción - Paraguay, September 2016) fo-

cused on the acquisition of skills in laparoscopic/endoscopic surgery of the abdominal wall:

1. Skills in open surgery
2. Skills in laparoscopic knots and sutures
3. Training in inanimate and animate models
4. Simulation
5. Selection of patients
6. Anatomical recognition
7. Surgical technique.

The aim is to offer technical tools that facilitate the performance of a safe laparoscopic/endoscopic hernioplasty.

Topic development

The key points for laparoscopic/endoscopic treatment could be synthesized by answering the following questions (Palmisano EM. XXII Conference of the Interior Surgery Chapter, Carmelo - Uruguay, June 2018):

1. What are we going to treat?
2. How to position the surgical team?
3. How to position the working ports?
4. How to achieve a critical security vision?
5. How to position and fix the mesh?

The general development will be oriented to the most prevalent parietal defects and as a practical guide for those surgeons who wish to begin their experience in laparoscopic / endoscopic hernia repair through safe practice.

What are we going to treat?

The choice of surgical technique will depend, to a large extent, on the experience of the acting surgeon. It is essential to plan the surgical technique and tactics with a correct selection of the patient, depending on whether it is a primary or recurrent hernia, single or multiple, the size of the ring, its location, its proximity to bone edges, if there are diagnostic doubts or pre-existing diseases and each patient's working and recreational activities. In large defects, it is important to determine the need for the application of botulinum toxin and progressive preoperative pneumoperitoneum

[1,2]. Therefore, the most appropriate type of surgical approach should be chosen in each case⁴ and adapted to the surgeon's experience curve [3-5].

How to position the surgical team?

In general terms, we could say that the disposition of the surgical team varies according to: 1. location of the defect, 2. type of access/technique and 3. comfortable position of the professionals that operate, in order to achieve the best possible ergonomics.

As an example, we could mention the defects of the midline, in these cases when deciding to perform an IPOM plus technique (Intraperitoneal onlay mesh with closure of the defect) plus the placement of mesh suitable for visceral contact) as a general rule, guidelines proposed by Leblanc [6] are followed. The surgical team is located to the left of the patient facing the videolaparoscopy tower (to the right of the patient), while when performing a Pre-Aponeurotic Endoscopic Repair (REPA) a technique designed to treat midline defects associated with diastasis of the rectus muscles- the surgeon stands between the patient's legs, his assistant on the left or right according to preference, facing the videolaparoscopy tower located at the level of the right shoulder or the patient's head) (Figure 1) [7-9].

Figure 1: Position of the surgical team in performing the REPA technique.

A similar situation occurs in laparoscopic/endoscopic repairs of hernias in the inguinal and femoral region, we would even say that the position of the surgeons is much more variable, in the Trans

Abdominal Pre-Peritoneal Access (TAPP) [10] it is approached from the left, whether a unilateral or bilateral defect, or modifying the position of the surgical team from one side to the other as in the classic TAPP; similar to what happens in extended vision extraperitoneal techniques (eTEP) or (PET) respectively [11].

How to position the working ports?

In midline defects, Leblanc [6] proposes the placement of the working ports following the left anterior axilla line, as a recommendation to always place them once the pneumoperitoneum has been created so that a larger surface will be available for this purpose, it is advisable to place the optic trocar at least at 2 fingers below the mentioned line, in order to improve triangulation. The secondary port corresponding to the right hand should be located 2 fingers below the costal margin to avoid eventual vascular-nerve injury and discomfort due to movement limitations because of proximity to bone structures (Figure 2).

Figure 2: Position of the optical and secondary ports in the IPOM Plus technique.

The other trocar that corresponds to the left hand should be placed above an imaginary line that joins the entire superior iliac spine and the navel, avoiding possible injury to the nerves that go to the inguinal region.

In the accesses for REPA, the optical port is located at the supra-pubic level while the secondary ports are positioned in both iliac fossae (Figure 3) [7-9].

Figure 3: Position of the optical and secondary ports in the REPA technique.

The location of the working ports in laparoscopic/endoscopic repairs of hernias in the inguinal and femoral region is very versatile. In TAPP repair [10] we can choose different options, the umbilical optic port and the operators on both flanks (Figure 4) or on the left flank up to even a higher position to achieve a more extended access [12], or we can place them paraumbilically at least 5 finger slants with respect to the midline.

Figure 4: Position of the optical and secondary ports in the TAPP technique.

In TEP accesses, the placement of the umbilical optical port and the other working ports in the infraumbilical midline is common; one of the advantages of eTEP (Figure 5) is the expansion of the operative field and thus, making the placement sites of the working ports more flexible, generally placing the optic port in the hypochondrium at the level of the midclavicular line and the secondary operating ports as appropriate [11].

Figure 5: Position of the optic port in the hypochondrium at the level of the midclavicular line and the secondary ports as appropriate.

How to achieve a critical view of security?

The critical view of safety of the myopectineal orifice must be understood as a concept of anatomical interpretation that outlines and/or exposes the elements that we must visualize prior to the repair of the defect, the positioning and fixation of the mesh (Figure 6) [13,14]; although its description was made for the defects of the inguinocrural region, we could extrapolate this definition to the defects of the midline with the correct visualization of the hernial ring after the reduction of the content and once the exhaustive conditioning of the abdominal cavity has been carried out, the defect must be repaired and the abdominal wall must be reinforced with a prosthesis.

How to position and fix the mesh?

The positioning of the meshes in the defects of the midline is directly conditioned by the dimensions of the hernial ring, the size of the prosthesis and its overlap (minimum 5 cm), and the plane in which the mesh is to be placed, the trend is to place larger and larger meshes, which must be neatly positioned by placing cardinal points and their subsequent fixation [7-9,15-17].

Figure 6: The critical view of safety of the myopectineal orifice.

The final aim is the same for both TAPP and TEP/eTEP techniques. What differentiates them is the mode of access, that is to say that the preperitoneal space where we will finally place the mesh is exactly the same, so with a correct dissection, we can place a mesh of 12 x 15 cm or larger (Figure 7). Current guidelines recommend mesh fixation for large defects (LIII/MIII) in extraperitoneal accesses (Grade A recommendation) and repair without fixation in types LI-II and MI-II (Grade B recommendation) [18]. The different alternatives available are invasive means, absorbable or not, stitches with absorbable sutures or not and fixation through the use of glue.

Figure 7: Placement of large meshes.

Conclusion

Laparoscopic/endoscopic repair of primary hernias and incisional hernias requires the surgeon to have systematic and specialized training and the elaboration of guidelines for their management and standardization of the techniques, which will facilitate their execution with an acceptable rate of morbidity and recurrence.

Bibliography

1. Palmisano E., *et al.* "Combinación de toxina botulínica A y neumoperitoneo preoperatorio progresivo abreviado como técnica adyuvante para la reparación de grandes hernias de la región inguinal. Reporte de un caso". *Revista Hispanoamericana de Hernia* 5.4 (2017): 178-181.
2. Danguise E. "Hernia inguinal". En: Patología de las paredes abdominales. Hugo Garcia, Gonzalo Crossbie, sebastian Jaimarena. Ed. Librería Akadia Editorial. 8: 98. Buenos Aires (2015).
3. Pisanu A., *et al.* "Meta-analysis and review of prospective randomized trials comparing laparoscopic and Lichtenstein techniques in recurrent inguinal hernia repair". *Hernia* 19.3 (2015): 355-366.
4. Acuña Barrios J., *et al.* "Hernioplastias inguinales por vía laparoscópica". *Revista Hispanoamericana* 4.3 (2016): 87-96.
5. Simons MP, *et al.* "European Hernia Society guidelines on the treatment of inguinal hernia in adult patients". *Hernia* 13.4 (2009): 343-403.
6. LeBlanc KA and Booth WV. "Laparoscopic repair of incisional abdominal hernias using expanded polytetrafluoroethylene: Preliminary findings". *Surgical Laparoscopy Endoscopy and Percutaneous Techniques* 3.1 (1993): 39-41.
7. Juárez Muas DM., *et al.* "Reparación endoscópica prefascial de la diástasis de los rectos: description de una nueva técnica". *Revista Hispanoamericana de Hernia* 5.2 (2017): 47-51.
8. Juárez Muas DM. "Preaponeurotic endoscopic repair (REPA) of diastasis recti associated or not to midline hernias". *Surgical Endoscopy* 33.6 (2019): 1777-1782.
9. Juárez Muas DM and Cuccomarino S. "Reparación endoscópica preaponeurótica (REPA)". En: Manual Práctico de Cirugía Endoscópica de Pared Abdominal. Ezequiel M. Palmisano y colaboradores. Ed. Editores de Argentina (2020): 159-170.
10. Palmisano EM and Blanco M. "Hernioplastia inguinal transabdominal preperitoneal (TAPP) sin fijación de la malla". *Revista Hispanoamericana de Hernia* 8.1 (2020): 19-24.
11. Palmisano EM., *et al.* "Maniobras claves y trucos en eTEP". *Revista Hispanoamericana de Hernia* 6.2 (2018): 86-90.
12. Valencia Salazar JC. "Trans Abdominal Pre Peritoneal de visión extendida (eTAPP)". En: Manual Práctico de Cirugía Endoscópica de Pared Abdominal. Ezequiel M. Palmisano y colaboradores. Ed. Editores de Argentina (2020): 51-58.
13. Daes J and Felix E. "Critical View of the Myopectineal Orifice". *Annals of Surgery* 266.1 (2017): e1-e2.
14. Palmisano EM and Brea Andrade A. "Actualización de la nomenclatura del orificio miopectíneo en la reparación endoscópica de las hernias de la región inguinal". *Revista Hispanoamericana de Hernia* 9.1 (2021): 46-49.
15. Moreno Egea A. "Intra Peritoneal Onlay Mesh Plus (IPOM Plus)". En: Manual Práctico de Cirugía Endoscópica de Pared Abdominal. Ezequiel M. Palmisano y colaboradores. Ed. Editores de Argentina (2020): 131-138.
16. Aguirre M. "Trans Abdominal Pre Peritoneal Ventral (TAPP Ventral)". En: Manual Práctico de Cirugía Endoscópica de Pared Abdominal. Ezequiel M. Palmisano y colaboradores. Ed. Editores de Argentina (2020): 139-148.
17. Palmisano EM and Ferreyra B. "Tratamiento de las hernias de la línea media en la era de la cirugía laparoscópica". *PROACI. Vigésimoprimer Ciclo Módulo 3* (2017): 141-154.
18. Bittner R., *et al.* "Update of guidelines on laparoscopic (TAPP) and endoscopic (TEP) treatment of inguinal hernia (International Endohernia Society)". *Surgical Endoscopy* 29.2 (2015): 289-321.

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