

ORIGINAL ARTICLE

E-TEP IN VENTRAL AND INCISIONAL HERNIA REPAIR - OUR EXPERIENCES

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ABSTRACT

Background: Rives-Stoppa repair has become the standard for repairing ventral and incisional hernias. The endoscopic retromuscular approach has the same benefits and offers the advantages of minimal invasive surgery.

Method: The technique is based on the retromuscular approach to the linea semilunaris (longitudinal technique) or the linea semicircularis (transverse technique). The incision is made on the anterior rectus sheath, and the trocar is placed below the muscle. A retromuscular space is created and the neck of the hernia sac can be reached. Upon release of the hernia, the sheath of the opposite rectus muscle opens up entirely up to the semilunar line, allowing the creation of enough space for placing the mesh. The mesh can be fixed using transcutaneous sutures, glue or be non-fixed. It is not always necessary to close the defect.

Results: Between 2003 and 2017 we performed 108 operations. We had 35 umbilical, 17 epigastric, one Spigelian and 55 incisional hernias. There were no intraoperative complications with ventral hernias, and one bowel injury in the incisional hernia group. There were five conversions and four recurrences. All of them were caused by a small mesh, after insufficient dissection. There were no infections.

Conclusion: Unlike LVRH, e-TEP will probably achieve the results and benefits of the retromuscular open technique.

Keywords: ventral hernia, endoscopic retromuscular approach, laparoscopic ventral hernia repair

INTRODUCTION

Over the last twenty years Rives-Stoppa repair has become the standard for repairing big ventral and incisional hernias¹. This approach allows good mesh position, easy and cheap fixation, and the possibility of implanting a broad spectrum of meshes.

IPOM, as a laparoscopic variant, presented as a replacement for the open technique, but failed to achieve the results of the Rives-Stoppa operation for several reasons. A mesh placed intraperitoneally

caused adhesions as complications, and adequate mesh fixation was an issue. The mesh, in addition, has to be specially designed and is still extremely expensive for the vast majority of countries.

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E-TEP, the enhanced or extended view and totally extraperitoneal technique, an endoscopic retromuscular approach, has the same benefits as the previously mentioned technique and offers the advantages of minimal invasive surgery^{2,3}. We started practicing this surgical technique as an alternative to open surgery in the early 2000's, and the underlying reason was economically difficult situation of the country that was emerging from the earlier war in Serbia in 1999, and a lack of funds for procurement of expensive materials. We based our operations on the work of M. Miserez⁴ from 2002.

Surgical technique

The technique is based on the retromuscular approach to the linea semilunaris (longitudinal technique) or linea semicircularis (transverse technique) (Figure 1). Placement of the optical 12 mm trocar is at the level of the hernia (Figure 1), under direct control. The incision is made transversally to the anterior rectus muscle fascia, proximal to the linea semilunaris, so that the edge of the rectus muscle is displaced medially and the trocar is placed below the muscle. By insufflation and blunt dissection using optical instruments, a working space is created. Two operating 5mm trocars are set up to provide a good ergonomic position.

The longitudinal approach is optimal for middle-line hernias, while the transverse one is suitable for hernias in the substernal region. A 30° scope is necessary for the adequate positioning of operating ports. This position is good for hernias in the middle line and also to access lateral hernias on the opposite side. In the case of a Spigelian hernia, the trocars can be placed along the medial line, thus avoiding its opening. Immediately after creating the retromuscular space, we reach the medial edge of the posterior rectus fascia or the neck of the hernia sac⁵. This may be difficult to dissect, especially if any surgical procedure was performed earlier in this region. In the case of a major defect, the dissection is often made difficult by the proximity of the hernia sac. In this situation, it is preferable to open the medial edge of

the rectus sheath above or below the defect, and thus open the retromuscular space from the opposite side (Figure 2). In this way, a significantly better working space is obtained and it is easier to approach the neck of the defect.

To ease the work and improve visualization, we modified the standard trocar (Figure 1) in order to obtain a visual space that is not covered by the rectus muscle placed above the top of the optical instruments. The dissection of the hernia sac is often related to the opening of the peritoneum attached to the fascia, especially in umbilical hernias. This allows intraabdominal inspection and adhesiolysis. Upon the release of the hernia, the sheath of the opposite rectus muscle opens up entirely, up to the linea semilunaris. This allows the creation of a large enough space for placing the mesh (Figure 3). It is necessary to close the peritoneum to avoid contact of the mesh with the intestines. The mesh is positioned to fill the entire space between the rectus, while its proximal and distal size depends on the diameter of the defect.

Depending on the surgical technique, we can divide all the operations into three groups, and they are related to the professional experience acquired by the surgeon and the spread of indications to larger and more complicated hernias. In the first group, in all operations fixing the mesh using transcutaneous sutures, usually four were mandatory irrespective of the size of the defect. The second group were patients who were treated later, and in cases of a defect smaller than 5 cm, operations were performed without fixation or the occasional use of glue. In defects larger than 5 cm, in addition to the fixation mentioned above, we closed the defect using V-locTM thread, where the thread is drawn to the skin, and tightened after the operation and exsufflation. The third group are patients with a major defect, where it is necessary to close the posterior rectus fascia, which is not easily done due to the tension and position of the trocars. In these cases, it is necessary to move the trocars to the transversal position and add the TAR to create flaps without tension⁶. The procedure is completed by closing the defect before placing the mesh.

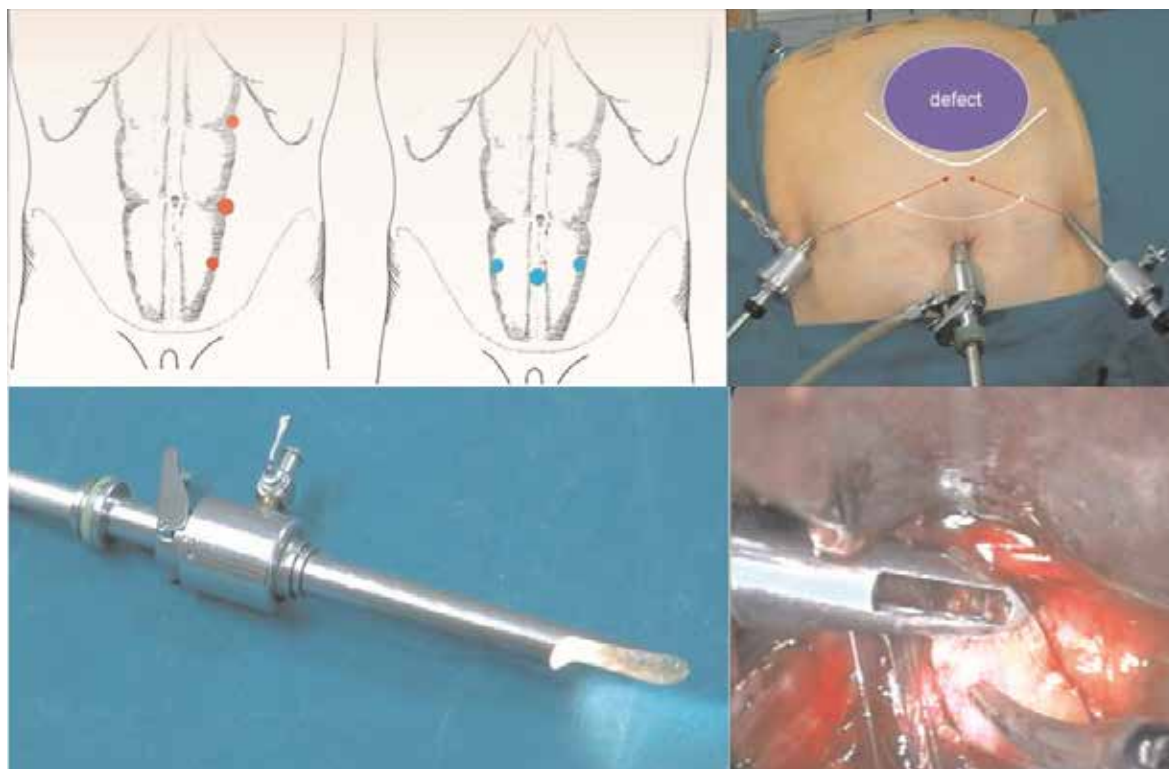


Figure 1. Placement of trocars and a modified standard trocar.

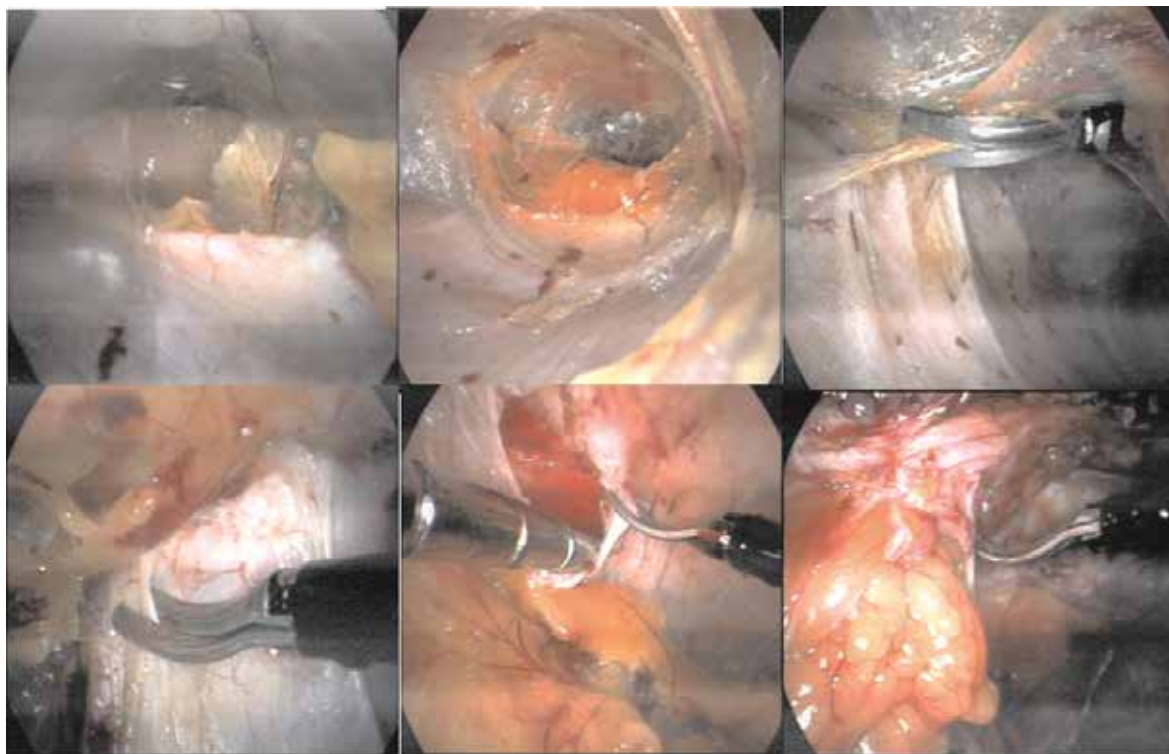


Figure 2. Dissection of the medial edge of the rectus sheath.

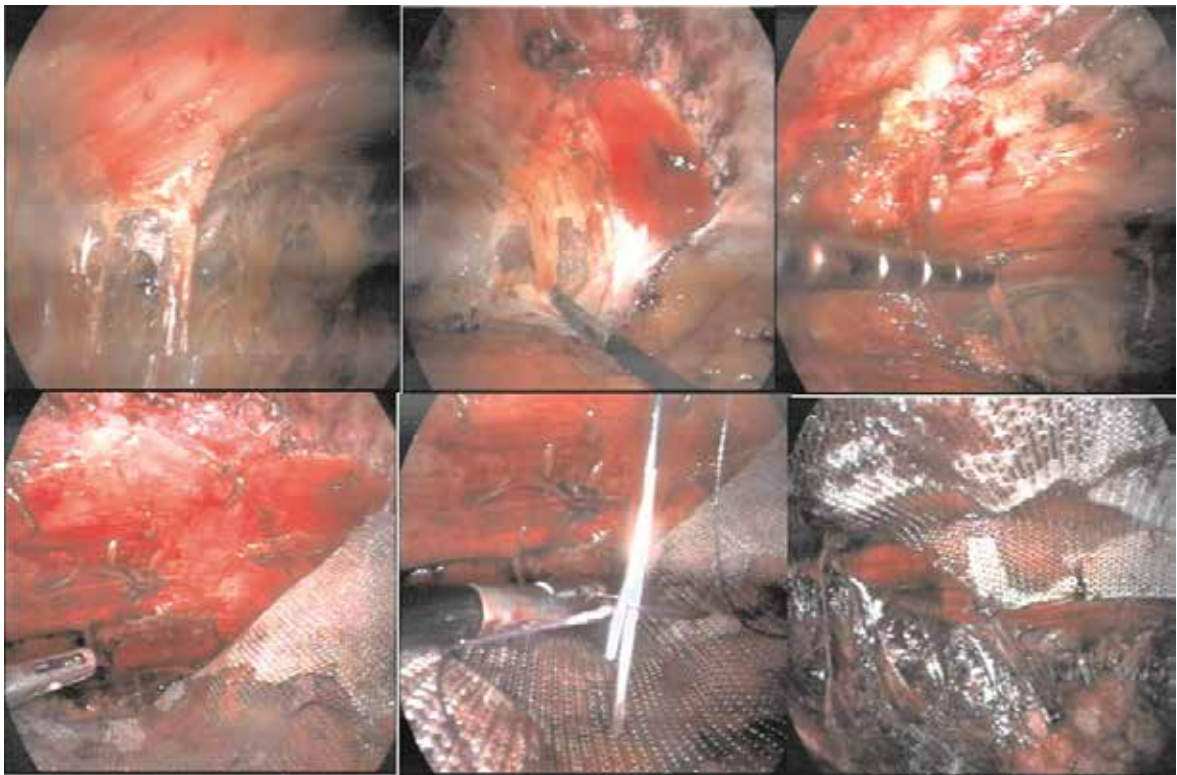


Figure 3. Creating a space to place a mesh, and placement of the mesh.



Figure 4. Immediate results at the end of the surgery.

Results

In the period between 2003 and 2018 we performed 108 operations in selected cases. Patients with symptoms of chronic and acute incarceration were excluded, but some of the patients that underwent surgery had irreducible hernias. The patients were between 42 and 78 years old. We had 35 umbilical, 17 epigastric, one Spigelian and 55 incisional hernias. The lateral approach was used in most cases. There were no intraoperative complications in ventral hernias, and one bowel injury occurred in the incisional hernia group. Five conversions to an open surgery technique were made. Four recurrences were noted, all of them caused by placing a small-dimension mesh, after insufficient dissection. There were no infections noted. Very low postoperative pain and discomfort were reported by a few patients.

Discussion

Regardless of all the benefits of laparoscopic ventral hernia repair, LVHR, it has not achieved the basic principles of retromuscular open technique that made the Rives Stoppa technique a standard in the treatment of incisional hernias⁷. The intra-peritoneal positioning of the mesh requires a special type - a composite type mesh, larger meshes to provide better fixation, and various fixation methods, which increases the likelihood of visceral adhesions. All of this significantly increases the cost of surgery, reduces indications, and affects the percentage of complications and recurrence⁸. Placing the mesh in the preperitoneal area by the endoscopic technique complements the classic operation with the benefits of an endoscopic approach. The belated development of this surgery is related to the demanding operational technique and the necessary experience of the surgeon. The operation requires a good knowledge of the basic surgical technique, the anatomy of the abdominal wall, as well as mastering the laparoscopic technique⁹. Initial problems and the inexperience of surgeons determined that our selection of patients was narrowed down to smaller hernias set in the middle line. After doing almost

twenty operations, we came to the conclusion that if a large enough dissection was made and the whole retromuscular space was covered by the mesh, then there was no possibility of the mesh moving, nor of the mesh protruding through the abdominal wall defect, if that defect did not exceed 5cm in the transverse diameter. We did not close the posterior rectus fascia in any of these cases.

The quality of the surgery was reflected in the minimal patient discomfort and in the patients' quick return to regular physical activity without any pain. The recurrences we had were related to the inexperience of surgeons, inadequate dissection in the sagittal diameter, and insufficient mesh size. The absence of defect closure in this group of patients was not of aesthetic significance given that the size of the defect was not great, which enabled the good remodeling of the skin (Figure 4). Closing of the defect is not always necessary, and it is complicated by an unfavorable angle in relation to the working trocars, as well as increased tension due to the pneumoperitoneum.

The transition to surgery on patients with a larger defect required closure which we resolved by using V locTM. The following group includes patients with a defect of a diameter greater than 10 cm. We performed 15 operations with the addition of TAR that allowed the closing of the posterior fascia of the rectus^{10,11}. This is a more demanding technique, but it enables the completion of the indicated area in a significantly larger number of patients. We believe that in this case the fixation of the mesh does not matter if the hernia defect can be closed¹¹. The mesh covers the complete retromuscular space transversally, and longitudinally we always set the whole length of the mesh of 30 cm. Drainage is occasionally used, and antibiotics only in patients with a risk of serious infections. The average time of the operation without TAR is 75 minutes, and the average hospitalization is 5 days.

Conclusion

E-TEP is an operation that successfully combines the benefits of the endoscopic approach and retromuscular mesh position, and provides satisfactory functional and aesthetic results with a decrease in the percentage of complications. The increasing use of this technique in the last few years will provide the necessary experience and ensure its further advancement. The results are directly dependent on the experience of surgeons, both in classical hernia surgery and in endoscopic surgery.

Conflicts of interest

The authors have no conflict of interest.

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