

LAPAROSCOPIC HERNIA REPAIR: NONFIXATION MESH IS FEASIBLY?*Correção de hérnia laparoscópica: tela sem fixação é viável?*Alberto MEYER¹, Jean-Louis DULUCQ², Ahmad MAHAJNA³

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HEADINGS - Laparoscopic surgery. Inguinal hernia. Surgical mesh.

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DESCRITORES - Laparoscopia. Hérnia Inguinal. Tela cirúrgica.

ABSTRACT - Background - Several surgical techniques have been developed over the past years, and total extraperitoneal and transabdominal preperitoneal inguinal hernia repair are the endoscopic techniques that are most commonly used. **Aim** - To describe and discuss Dulucq's technique and the modifications of using 3-D mesh in total extraperitoneal inguinal hernia repair. **Methods** - Patients who underwent an elective inguinal hernia repair were enrolled prospectively in this study. Operative and postoperative course were studied. **Results** - A total of 261 hernia repairs were included in the study. The hernias were repaired by total extraperitoneal technique; two hernias (0.75%) were converted to open anterior Liechtenstein technique. Mean operative time was 43.38 min in unilateral hernia and 53.36 min in bilateral hernia. Most of the patients (95%) were discharged at the same day of the surgery. The overall postoperative morbidity rate was 5.7%. The incidence of recurrence rate was 0.0% in median follow-up period of 26 months. **Conclusion** - Total extraperitoneal hernioplasty is a very effective and safe procedure in the hands of experienced surgeons with specific training. It is an interesting option in bilateral and recurrent hernia as it obtains satisfactory results in terms of postoperative pain and morbidity.

RESUMO - Racional - Várias técnicas cirúrgicas têm sido desenvolvidas ao longo dos últimos anos, e a correção de hérnia inguinal pré-peritoneal totalmente extraperitoneal e transabdominal são as técnicas endoscópicas que são mais comumente utilizadas. **Objetivos** - Descrever e discutir a técnica de Dulucq e as modificações do uso da tela 3-D na correção de hérnia inguinal totalmente extraperitoneal. **Métodos** - Foram incluídos prospectivamente neste estudo pacientes submetidos à correção de hérnia inguinal eletiva. Foram estudados os aspectos operatórios e pós-operatórios. **Resultados** - Um total de 261 correções herniárias foram incluídas neste estudo. Elas foram realizadas pela técnica totalmente extraperitoneal; duas (0,75%) foram convertidos para técnica anterior de Liechtenstein. O tempo operatório médio foi de 43,38 min em hérnia unilateral e 53,36 min em hérnia bilateral. A maioria dos pacientes (95%) teve alta no mesmo dia da operação. A taxa de morbidade pós-operatória foi de 5,7%. A incidência de recidiva foi de 0,0% em média de 26 meses. **Conclusão** - Hernioplastia totalmente extraperitoneal é procedimento eficaz e seguro nas mãos de cirurgiões experientes e com formação específica. É uma opção interessante para hérnia bilateral e recidivante, uma vez que obtém resultados satisfatórios em termos de dor pós-operatória e morbidade.

INTRODUCTION

Inguinal hernia repair is the most common procedure in general and visceral surgery worldwide. Over the past two decades, laparoscopic inguinal hernia repair has become more and more popular^{13,14}.

A few recent randomized controlled trials and meta-analyses comparing laparoscopic repair to open repairs demonstrated that laparoscopy offered the following benefits^{8,11,25}: less postoperative pain, less analgesic consumption, earlier return to normal activities and work; fewer long-term complications of groin pain and permanent paraesthesia, but an equivalent recurrence rate compared to open mesh repairs.

Several surgical techniques have been developed over the past years,

and total extraperitoneal (TEP) and transabdominal preperitoneal inguinal hernia repair (TAPP) are the endoscopic techniques that are most commonly used. Laparoscopic hernia repair requires special skills to overcome limitations inherent to this type of surgery, such as loss of depth perception, limited range of motion, and reduced tactile feedback. As a consequence, endoscopic hernia repair has a significant learning curve and is associated with prolonged operating times³.

Debate still remains over which technique is the superior. The popularity of TEP is growing, as many surgeons have become wary of the potential for complications when entering the peritoneal cavity using the transabdominal approach. TEP has demonstrated favourable short-term results, with regards to reduced postoperative stay, pain and earlier return to physical activity in comparison with open mesh repairs^{2,16,20}.

Mesh fixation in laparoscopic surgery soon became a contested aspect of inguinal hernia surgery, with the use of tacks possibly contributing to the development of sensory nerve damage due to a higher risk of nerve entrapment, most notably the genitofemoral nerve^{1,7}.

This prospective study evaluated the safety and effectiveness of the Dulucq's technique^{8,10} and the use of 3-D mesh in laparoscopic TEP inguinal hernia repair.

METHODS

Patients who underwent an elective inguinal hernia repair at the Department of Surgery, Professor Edmundo Vasconcelos Hospital, São Paulo, Brazil between May 2009 and June 2012 were enrolled prospectively in this study. Were evaluated subjects for inclusion in a consecutive series of laparoscopic hernia repair who had undergone TEP procedure. The technical details of the procedure are described elsewhere (ABCD 2013;26(1):59-61) The protocol of this study was approved by the Medical Ethics Committee of Professor Edmundo Vasconcelos Hospital.

Patient demographic data, operative and postoperative course, and outpatient follow-up were studied. The following data were collected retrospectively: age, sex, American Society of Anesthesiologists (ASA) physical status score, duration of surgery, intraoperative complications, postoperative complications, hospital stay, recurrence and distant events.

Variables are presented as mean and standard deviation. Statistical analysis including the χ^2 test and Student's t test was carried out where appropriate. A p value of less than 0.05 was considered statistically significant.

RESULTS

Were performed 261 laparoscopic TEP repair with 3-D mesh under general anaesthesia in 157 patients. The difficulty caused by prior radical prostatectomy in two patients resulted in the conversion (0.75%) to open anterior Liechtenstein technique. The majority of these patients were male (96.8%), with a mean age of 48 years. One female patient had 10 years old when she was operated for recurrent hernia, had great difficulty due to limited space and it was feasible to have been made because it is near to the end of the series coinciding with the accumulated experience of the surgeons involved. Eleven percent of the hernias were recurrences after conventional repair and 55 (35%) individuals underwent previous surgery in the lower abdomen. The median ASA grade was 2, with 52% of them having one or more comorbidities. Hernia characteristics are shown in Table 1.

TABLE 1 - Hernia characteristics

Variable	N (%)
Site of hernias	
Right	51 (32,5%)
Left	41 (26%)
Bilateral	65 (41,5%)
Types of hernia	
Direct	85 (32,6%)
Indirect	172 (66%)
Femoral	3 (1%)
Spiegel	1 (0,4%)
Recurrent	30 (11,5%)

Mean operative time was 43.38 min in unilateral hernia and 53.36 min in bilateral hernia. The mean hospital stay was less than 12 hours in 95% of the patients. A total of nine complications occurred (5.7%), including one injury to the iliac vein treated by compression, four patients with large hernias developed seroma, one patient had scrotal haematoma, one patient suffered from hematuria without bladder lesion and two patients had subcutaneous emphysema. All these complications were managed conservatively. The median follow-up period was 26 months (1-43 months). There was no recurrence of hernia within this early postoperative period.

DISCUSSION

Laparoscopic hernia repair has several advantages over conventional open methods as shown by prospective randomized trials comparing to tension-free open herniorrhaphy.⁶ The major advantages include less postoperative pain, earlier return to normal activities and work, better cosmetic results and cost effectiveness^{4,15}.

Laparoscopic inguinal hernia repair is associated

with a higher demand in technical skills. A learning curve of at least 40 cases is necessary to reduce the rate of complications and recurrences¹¹. It is currently thought that all recurrences appear within the first two years of follow-up. One of the way to shorten the learning curve and minimize the recurrence is to refine the techniques in a major center.

Historically, cost analysis favored open hernia repair over laparoscopy. However, with more than a decade of experience in laparoscopic hernia repair and the dissemination of knowledge to all regions, the cost fell and became comparable to open repair^{4,18}. Most of the patients (95%) were discharged less than 12 hours as an outpatient procedure; four patients were discharged at the second day⁵. The performance favors the patient, reduces hospital costs and do not provides benefit more time of hospitalization.

Intraoperative major complications are rarely seen in hernia surgery. A more common intraoperative complication encountered with TEP and TAPP is injury to the bladder (0%-0,2%), mainly in patients with previous suprapubic surgery. There was one hematuria without lesion confirmed by cystography probably occurred due to manipulation near the bladder. Recently, prospectives studies were designed to examine the feasibility and to evaluate the surgical outcome of laparoscopic TEP hernia repair in patients who had undergone previous lower abdominal surgery or radical prostatectomy. These studies observed that TEP can be performed with no increase in adverse events similar to patients without previous surgery^{9,13,16}.

Studies on TEP and TAPP report intraoperative bowel injury in 0% to 0,3% of cases in large investigations involving considerably more than 1000 patients, and damage to major vessels at rates of 0% to 0,11%¹⁴. Injury to these vessels can be fatal and usually requires an urgent laparotomy and vascular repair. In this series the injury to the iliac vein was very small and easy to treat.

Problems may arise if the patient is not in the Trendelenburg position. In this case, the bowel may remains within the hernia sac and the risk of bowel diathermy injury increases. Patients with unrecognized bowel injuries generally present 3-7 days after surgery with complains of fever and abdominal pain. However, reported intervals from time of occurrence of injury to onset of symptoms vary from 18h to 14 days^{7,21}. Since the follow-up of this series was relatively short, the results may apply mainly to the operative and early postoperative courses.

The laparoscopic TEP repair is performed under general anesthesia with a good curarisation, otherwise the workspace is too small. The dissection must always be done with the same steps, for the technique to be reproducible. During the dissection, the surgeon must see the spider's web aspect to indicate that he is in the right direction.

One of the debates about the TEP techniques

is whether stapling is necessary. Staples could induce damage to sensory nerves leading to disabling neuropathies²⁰. In a case-control study comparing selective non-stapling against stapling for TEP hernioplasty, there was no hernia recurrence over a medium follow-up period of 1.4 years²⁰. In a randomized clinical trial comparing fixation vs nonfixation of mesh there was no clinical advantages and increases the cost of the process in mesh fixation²⁵. Based in other experience with 5.203 TEP operations, it was possible to dispense with mesh fixation in more than 95% of cases¹⁴. It is thinkable that non-stapling could possibly shorten the learning curve and operating time.

Was used three-dimensional (3-D) anatomically contoured polypropylene mesh for the reinforcement of the inguinal region. As the 3-D mesh conforms to the contour of the inguinal region, the possibility of mesh migration is minimal. The size 10 x 15 cm is large enough to cover all hernia spaces and proved to be favorable for laparoscopic handling².

TEP hernioplasty is an advanced laparoscopic procedure. Relative contraindications include patients unfit for anesthesia, obesity, large hernia, pregnant patients, patients with a history of lower abdominal surgery, recurrent hernia after laparoscopic hernia repair and patients with anticoagulant treatment. Were only operated symptomatic hernias¹⁴.

CONCLUSION

Laparoscopic hernia repair is our favourite technique. Total extraperitoneal hernioplasty is a very effective and safe procedure in the hands of experienced surgeons with specific training. It is an interesting option in bilateral and recurrent hernia as it obtains satisfactory results in terms of postoperative pain and morbidity.

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