

LAPAROSCOPIC APPROACH FOR INGUINAL HERNIA EMERGENCIES

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Laparoscopic approach for incarcerated or strangulated hernias is still controversial, for both technique transabdominal preperitoneal (TAPP) or extraperitoneal (TEP). There is also a continuous concern about meshes used, if they are easy to apply and also decrease the incidence of recurrences. Fibrin-glue is proved to decrease postoperative chronic pain syndrome that can appear secondary to tacks, even the restorable ones. The aim of the study was to investigate the benefits of 3D and fibrin-glue as fixation tool. We present the first part of a prospective ongoing study, from may 2012 till june 2015, enrolled 40 patients. Out of the 40 operations, 3 were performed for femoral hernias. Duration of the operation was between 60 – 190 minutes with an average value of 114 minutes. GIQLI score had an average value of 10,47 reported at a maximum value of 144. Pain Score average value was 3,05 on a scale from 1 to 10. Bowel movements started after an average of 1,25 days for gases and 1.87 days for stool. Average length of stay was 2,57. There were 3 conversions to open technique, no complications or death. Anatomically shaped mesh allows an easier application making the surgical technique easier, even in emergency. Fibrin glue does not seem to be at the origin of any postoperative chronic pain.

Keywords: TAPP, laparoscopy, emergency, hernia repair

INTRODUCTION

Laparoscopic approach for incarcerated or strangulated hernias is still controversial, for both technique TAPP (transabdominal preperitoneal technique) or TEP (extraperitoneal technique). There is also a continuous concern about meshes used, if that are easy to be applied and also decrease the incidence of recurrences. Fibrin-glue is proved to decrease postoperative chronic pain syndrome that can appear secondary to tacks, even the resorbable ones¹.

MATERIAL AND METHODS

We present the first part of a prospective ongoing study, from may 2012 till june 2015, in First Surgery Clinic of the University Emergency Hospital Bucharest, Romania. We enrolled 40 patients with inguinal hernia emergency resolved by trans abdominal preperitoneal technique (TAPP), 37 with incarcerated hernias and 3 with strangulated hernias. Out of 40 patients, 25 had indirect hernias, 12 had direct hernias and 3 femoral hernias. There were 3 recurrent hernias, all incarcerated. We had bowel resection in 2 cases (small bowel) laparoscopic assisted. There were three conversions to open technique, non complications or death. The reasons for conversion was for incarcerated hernias the dimension of the hernia and slipped organ; for strangulated hernias was the time from the onset, the intestinal laceration and the impossibility of hernia ring enlargement. We used in all patients the 3D mesh fixed with fibrin glue 1 ml.

Description of TAPP. Needs the following instruments: one 10 mm trocar for video camera, two 5mm trocars for

instruments. After the trocar are placed and inspection made, the peritoneum is incised and dissected from the superior anterior iliac crest to umbilical ligament. Take in mind some anatomical landmarks: epigastric vessels, iliac vessels, spermatic cord and deferens duct, round ligament, Coopers ligament. Entire pre-peritoneal inguinal area is prepared, hernia sac is dissected and reduced into the abdomen with its contents. If the hernia sac had a very large size (inguinoscrotal hernia) may be sectioned at the neck. If the ring of the hernia sac is too tight, kelotomy is necessary. The mesh is introduced into the abdomen and fixed. Suture of the peritoneum. Have extreme care for the bleeding in all this time.

Mesh debate There is a continuous concern about meshes used, if they are easy to be applied and also decrease the incidence of recurrences.

The European Association of Endoscopy Surgery (EAES) consensus from 2012, with an update in 2015² recommended that the mesh in groin hernia repair measures minimally 10/15cm; experimental studies showed the mesh has to overlap the inguinal defect with at least 3 cm to prevent recurrences due to the dimensions or protrusion. There is currently not enough evidence supporting the general use of light weight mesh over heavy weight mesh in endoscopic groin hernia repair³. The recommendations of International Hernia Society (IHS) about the mesh: it must be monofilament, the pore size at least 1,0 – 1,5 mm, the minimum tensile strength in all directions $>16 \text{ N/cm}^2$ ⁴.

The 3D mesh dimensions most used are *large*=16/10.8cm and *extra large*=17.3/12.4cm. It has anatomic shape already pre-cut, with reinforced on the margins. Has blue marker for the medial orientation, crest for the axis of

inguinal ligament and inferior notch aligns with the external iliac vessels.

Fixation devices For the fixation of the mesh there are a lot of materials to use, such as:

- *Suture*: resorbable/non – resorbable;
- *Staple*: resorb tacker / spiral tacker;
- *Self fixing* mesh;
- *Sealant*: Fibrin glue / Cyanoacrylat⁵

Fibrin glue About fibrin glue it was proven the following properties: (1) Reduction in postoperative and chronic pain. The recommendations of International Hernia Society (IHS): The risk of acute and chronic pain after staple mesh fixation is higher compared with fibrin glue fixation¹⁻⁶ (2) Lower need for postoperative analgesics⁷ (3) Less pain in the week following the surgery³ (4) Reduces early postoperative pain, discomfort, fatigue, sensation of foreign body⁸ (5) Does not increase the risk of hernia recurrence or complications, in fact is lower⁹.

Causes of chronic pain Non-neurophatic pain representing 70% is caused by tissue-lesion due to: periosteal reaction (due to suture or staple into the pubic tubercle); scar-tissue formation or mechanical pressure of rolled-up, folded or wadded mesh¹⁰⁻¹². Neurophatic pain representing 30% is caused by nerve injuries intraoperative (neurapraxia, axonotomesis, neurotomesis, complete transection) or nerve compression by perineural fibrosis due to suture materials, staples and tacks (traumatic fixation devices) and prosthetic materials^{13,14}.

RESULTS AND DISCUSSIONS

Patients age was between 23 and 86 years, with the average 54,12. The gender distribution male/female was 4:1. Out of the 40 operations, 3 were performed for femoral hernias. Three cases were recurrent hernia. Out of 40 cases, 37 was incarcerated hernias and 3 strangulated hernias. Duration of the operation was between 60 – 190 minutes with an average value of 114 minutes. The average of postoperative analgesic need expressed in days was 1.77. GIQLI score (Gastro Intestinal Quality of Life Index) had an average value of 10,47 reported at a maximum value of 144. Pain Score average value was 3,05 on a scale from 1 to 10. Bowel movements started after an average of 1,25 days (for gases) and 1.87 days for stool. Average length of stay was 2,57. There were three conversions to open technique, non complications or death.

Distribution by age group is represented in Figure 1 and the gender distribution in Figure 2.

The emergency hernia type resolved by laparoscopic approach is represented in Figure 3.

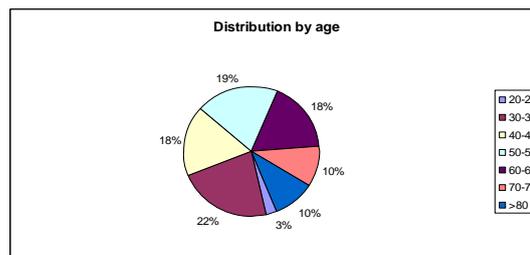


Figure 1. Distribution by age

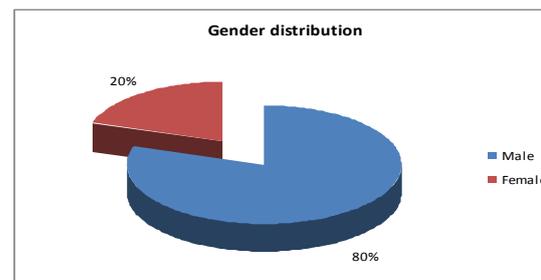


Figure 2. Gender distribution

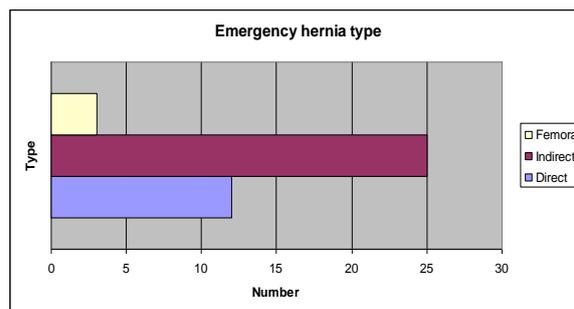


Figure 3. Emergency hernia type

Of the 40 cases, three were recurrent hernias, as shown in Figure 4.

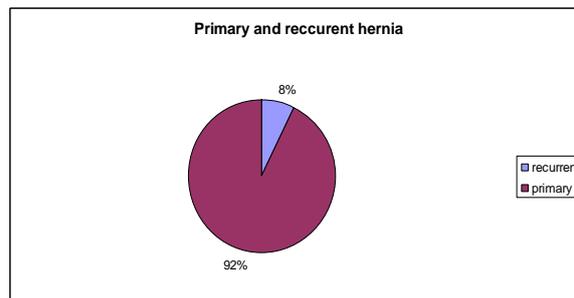


Figure 4. Primary or recurrent hernia

The classification of emergency hernia type in strangulated and incarcerated is represented in Figure 5.

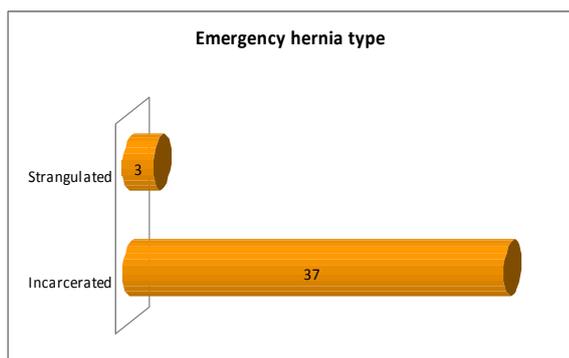


Figure 5. Emergency hernia type

Duration of the operation was between 60 – 190 minutes with an average value of 114 minutes. In most cases the duration of the operation was between 60 – 120 minutes, as shown in Figure 6.

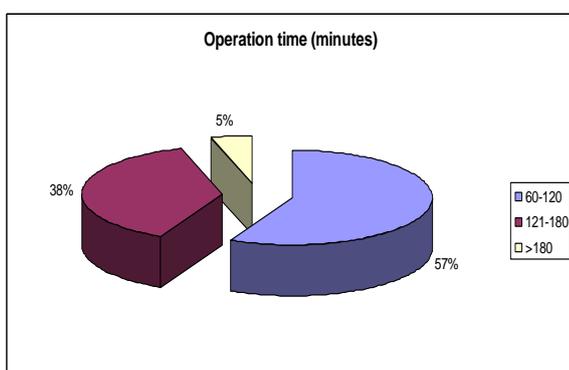


Figure 6. Operation time

Postoperative analgesic need is expressed in days as shown in Figure 7.

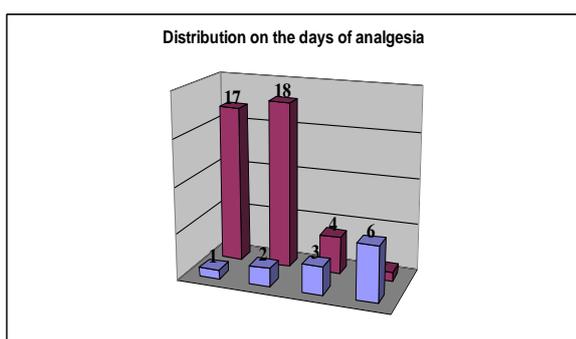


Figure 7. Distribution on the days of analgesia

For the postoperative evaluation of the patients we used Gastro Intestinal Quality of Life Index (GIQLI score) and Pain Score.

GIQLI score has a total of 36 parameters (Table 1) it is approaching that depending on the intensity of symptoms experienced by patients it is receiving a score between 0

and 4, the minim score is 0 and maximum score is 144¹⁵. GIQLI score had an average value of 10,47.

1. Abdominal pain
2. Feeling of abdominal fullness
3. Abdominal bloating
4. Trouble with flatulence
5. Trouble with burping or belching
6. Trouble with gurgling abdominal noises
7. Trouble with frequent bowel movements
8. Eating with pleasure
9. Need for selective food restriction
10. Stress
11. Sadness about the disease
12. Anxiety about the condition
13. Fortunately about life after surgery
14. Frustration caused by disease
15. Asthenia
16. Malaise
17. Waking up at night
18. Changing physical appearance
19. Physical strength
20. Endurance against disease
21. Felling "out of shape"
22. Daily activities
23. Relaxation
24. Medical treatment
25. Personal relationships
26. Impaired sexual life after surgery
27. Regurgitation (fluid or food coming up)
28. Trouble with swallowing (dysphagia)
29. Trouble with slow speed of eating
30. Trouble with nausea
31. Trouble with diarrhea
32. Trouble with urgent bowel movement

Table 1: GIQLI score

Pain Score average value was 3,05 on a scale from 1 to 10, as is represented in Figure 8.

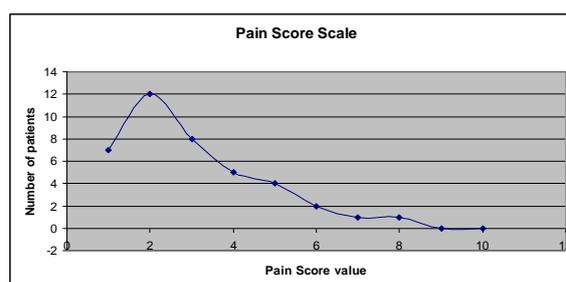


Figure 8. Pain Score scale

Bowel movements started after an average of 1.25 days (for gases) and 1.87 days for stool, as shown in Figure 9 and 10.

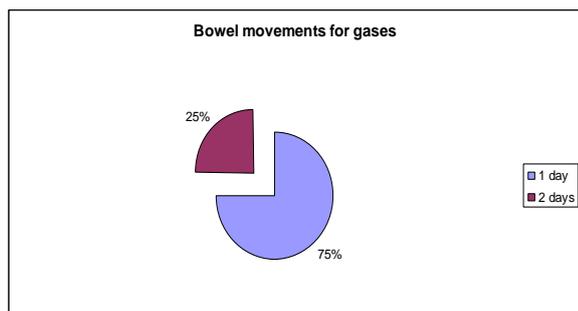


Figure 9. Bowel movements for gases

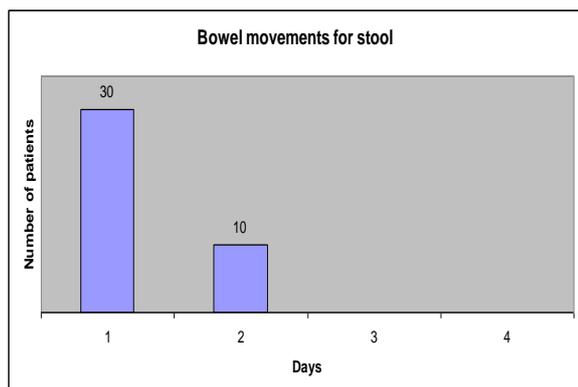


Figure 10. Bowel movements for stool

Average length of stay was 2.57, with a minimum of one day and a maximum of nine days, as represented in Figure 11.

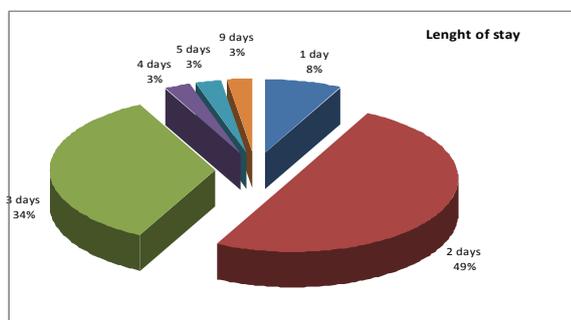


Figure 11. Length of stay

The average age in this study is comparable to a study comparing the outcomes and sociodemographic utilization results from the nationwide inpatient sample in laparoscopic versus open hernia repair¹⁶.

There is a continuous concern about meshes used, if they decrease the incidence of recurrences because the characteristics of the mesh and the fixation devices represents risk factors of recurrence.

Fibrin glue compared with tacks improves convalescence after TAPP, significantly reduce early postoperative pain, discomfort, fatigue, sensation of foreign body⁸, and also decrease the recurrences¹⁷.

The learning curve for TAPP in young surgeons is strictly related with the operation time. TAPP is a safe and reproductive technique when young surgeons are learning

under supervision of a experimented laparoscopic surgeon¹⁸.

The length of stay in this study is comparable to a study comparing the hospital costs and length of stay in laparoscopic (both TAPP and TEP) and open approach of inguinal hernia repair¹⁹.

CONCLUSIONS

Anatomically shaped mesh allows an easier application making the surgical technique easier, even in emergency. Because of its features is reducing the recurrence rate.

Fibrin glue, applied with its laparoscopic special device was not at the origin of any postoperative chronic pain in the cases studied, in fact it significantly reduce early postoperative pain, discomfort, fatigue, sensation of foreign body⁸, and also decrease the recurrences¹⁷.

When is used a standard technique and with an appropriate learning program, young surgeons can learn quick, with quality and safety this approach.

A romanian multicentric study could be a good project.

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