UNIVERSITY OF MEDICINE AND FARMACY CRAIOVA

PhD School

PhD Thesis Abstract

SURGICAL TREATMENT OF INCISIONAL HERNIAS

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INTRODUCTION

The surgical treatment of incisional hernias represents one of the most frequent intervention in general surgery together with the other abdominal wall defects. Their occurrence rate is of 0.5-12% for the patients with laparotomy in their historical record and 0.2 to 1.8% at patients with laparoscopic interventions .

Among time have appeared multiple procedures for repairing parietal defects which have created a series of discussions on postoperative complications of incisional hernias. One of the most feared is postoperative recurrence. We have observed an increased rate after tissular procedures between 31-58% and after prosthetic procedures is much lower rate reaching 8-10%.

We are currently witnessing at a development both prosthetic materials and methods that we are using and to the research for a more efficient method of fixation of the prosthesis during surgery which will help us to reduce postoperative complications.

CHAPTER I

Incisional hernias. History, definition.

Hernia is defined in literature as representing the visceral protrusion belonging to abdominal cavity through an anatomical zone, preformed, natural, while the **incisional hernia** represents the under tegument protrusion of viscera from the abdominal wall cavity at a thin zone level occurred after a laparotomical surgery or at the entering level of the trocars used in laparoscopic surgery or following trauma harp stick.

In the first chapter we presented the historical evolution of surgical treatment of incisional hernias. Anatomy of the abdominal wall was described almost 6000 years ago, when civilization has begun. The first mention and description of the abdominal wall was made by Professor George Ebers in 1862 , and surgery has developed over three principles: simple laparoplasty, auto and organic heteroplasty and alloplasty.

Laparoscopy, as treatment for parietal abdominal defects, is recently occurred, in 1990 being described by LeBlanc. This technique has as improvements the

hospitalization rate and the decreasing of the rate complications, while the recurrence rate remains at least similar to the one of open surgery.

Currently, the best approach is the one proposed by Stoppa by implanting the mesh outside the abdominal cavity .

CHAPTER II

Surgical, functional and pathological anatomy of abdominal wall

This paper aims to evaluate the influence of topographic anatomy on the functioning mechanisms of protection against incisional hernia and their importance in the choice of surgical technique to provide maximum efficiency in terms of recurrence rate and postoperative pain.

From functional point of view, the abdominal wall needs to be considered a unitary system: „this wall is composed of eight muscle, through which attract, keep, prepare, removes and performs many other functions" Andres de Laguna wrote in 1953.

Mio-aponeurotic layer is involved in actions such as flexion, extension and rotation of the trunk and pelvis, and also participates in the process of defecation, micturition, childbirth and breathing by increasing intra-abdominal pressure. In the presence of a large parietal gap, resulting from a total or partial disinsertion abdominal muscles and the presence of a hernia bag occurs intra-abdominal pressure drop and create a new cavitiy, affecting respiration, viscera, vascularization and the vertebraes.

Ideal for repairing parietal defect, is the reconstruction of each structural component of the abdominal wall using mio-fascial elements with their nervous and vascular pedicles.

From the anatomo-pathological point of view, incisional hernias present: a hole, a pocket and its content.

CHAPTER III

Incisional hernias clasifications

In the present thesis we used the classification made by the European Hernia Society for surface and localization, and in etiopathogenic terms, incisional hernias can be classified into congenital or acquired for children and to adults in traumatic or atraumatic.

CHAPTER IV

Etiopathogeny and incidence of abdominal incisional hernia

Among the factors of incisional hernias with a high importance are: obesity, impaired collagen metabolism and numerous factors both local and general triggering a vicious scarring. Any factor occurred during the process of wound healing may appereance of incisional hernias and defects in collagen production.

CHAPTER V

Diagnosis, evolution and complications of incisional hernias

The incisional hernias wall diagnosis is based on patient historical record and physical examination.

Laboratory diagnosis of incisional hernia is represented of the usual imaging tests to confirm pathologies, especially in patients with specific clinical conditions, such as obesity.

Evolution of incisional hernias consists in increasing the size of both the bag and parietal defect with the development of local and systemic complications.

Complications are represented by strangulation, incarceration or trauma bag incisional hernia.

CHAPTER VI

The surgical treatment of incisional hernias

The incisional hernias treatment is exclusively surgical and can be distingushed in three steps: the isolation of the incisional hernia pocket, its reduction and abdominal wall reconstruction.

To restore the abdominal wall current we use various surgical techniques. Some provide primary suture using the abdominal wall structures, others use

prosthetic materials that support the abdominal wall function after direct suture (plastic hardening) or substitution plasty where edges cannot be closed.

Today, in most cases of incisional hernia treatment are used plastic procedures. If incisional hernias are large or recurrent with loss of substance is indicated only to use meshes.

CHAPTER VII
Materials and methods

Aim of the study was to determine the most effective method of repairing incisional hernias in order to obtain results which states the presence of a low complications rate on a long term.

The study includes patients with abdominal wall defects, incisional hernias operated in the IVth Surgery Clinic from CF Hospital Craiova and in "Day and Week Surgery Clinic" at the Institute Santa Maria Multimedia Castellanza, Italy on a period of 6 years, January 1, 2007 -December 2012.

The retrospective aim is to analyze postoperative the incisional hernias in terms of etiopathogeny, clinical aspects, topography, the type of treatment applied to the reconstruction of the abdominal wall and the results , the attachment of prosthetic materials, the hospital stay and complications after surgical procedures.

Descriptive analysis according to different parameters, graphical representation and calculation of Pearson correlation coefficient r - was performed with Excel, Pivot Tables using the controls, Functions, statistics, Chart and Data Analysis module. To achieve complex statistical tests (Student's t test for comparing two means, Chi square test and Fisher's exact test to compare differences in distribution) were used XLSTAT or commands were performed using SPSS.

CHAPTER VII

The results obtained after analyzing the patients form IV Surgery Department Craiova

The analysis of 298 patients included in the study showed an increased incidence of median topography of the incisional hernias in females in the fifth age decade. In most cases the bags were unique and were involved etiopathogenic

triggers or contributing factors. We came across some of these, such as parietal suppuration, obesity, chronic diseases such as diabetes, cardiovascular disease or broncho-pulmonary discovered by the clinical and laboratory examination or in patients' history.

In the study group, 56 patients, which represents 18.79% of the total incisional hernias in the IVth Surgery Department, had recurrent postoperative incisional hernias resulting from association of etiopathogenic factors with inadequate surgical technique used for wound closure.

Primary closure of incisional hernias was used in 43 cases, 14.42% and 255 were prosthetic procedures, representing 85.58%. Depending on the place where it was placed, in the study group with prosthetic procedures, synthetic meshes were present in 197 cases sublay fixed with transfixiant wires through aponeurosis and the rectus abdominis muscle, in 42 cases the mesh was placed inlay and in 16 cases onlay. Large incisional hernias with loss of substance were present in 75 patients where was used for repair a substitution process. Patients with sublay fitted prosthesis had a mean hospital stay of 10 days, those with inlay or onlay prosthesis had a mean duration of hospitalization between 4 and 5 days.

Immediate complications were most common in surgery of incisional hernias: hematoma, seroma, parietal suppuration. Parietal suppuration was found in 20 cases and recurrences were present in 12 cases with tissular proceduresand and in 5 cases after prosthetic procedures which corresponds to 4.02% and respectively 1.67% of the total incisional hernias.

The results obtained by tracking the group of patients from Clinical Hospital Santa Maria Multimedia Castellanza

The group was made up of 99 clinical patients. Their number was small because of the confidentiality rules between the hospital, doctors and patient. The study group had 56 women and 43 men, with a maximum incidencein the 6^{th} age decade. As etiopathogenic factors, were found obesity associated with obstructive pulmonary disease, diabetes, vascular disorders.

89 of the 99 studied cases had a unique defect and 10 patients had a multiple defect. Depending on the history intervention record, we can observe an increased

number of cases after laparotomic surgery, while the smallest size was found in patients with laparoscopic interventions. The recurrent incisional hernias had an average size varied between 25 and 125 cm^2.

Of the 99 patients operated for incisional hernias at various sites in the abdominal wall for the majority 67 (67.68%) was performed a retromuscular intervention.

For 10 of the patients (10.10%) associated with abdominal obesity was associated abdominoplasty performed by plastic surgeon or dermolipectomy performed by general surgeon.

The tissular method was used for 7 (7.07%) patients, laparoscopic procedure only for 5 (5.05%) patients and for other 10 patients from the study group were used other surgical methods to repair the parietal defect and to realise the abdominal wall reconstruction.

The retromuscular - preperitoneal procedure used many types of protheses: the polypropylene composite Physiomesh, vycril mesh and 2 biological meshes . In 37 of the cases the mesh was fixed only with fibrin glue, adhesive that has the ability to attach the mesh to the surrounding tissue without any further stitches between the mesh and the abdominal wall components , in 48 (48.48 %) of the cases was used the polypropylene mesh fixed with Prolene stitches .

It was observed that the hospitalization time for patients who used fibrin glue had an average of 5 days, but it depends on the fixation method, the location, size of the defect and surgical technique. In patients with prosthetic fixed by sutures the length of stay was more than 6 days.

Immediate postoperative complications were observed in only 6 from the 99 patients including postoperative hematoma, ileal perforation, infection, wound necrosis . Late complications were the postoperative pain with a lower rate where the fixation was "sutureless" and recurrences were encountered after a follw-up realised at a month, 3 months, 6 months and then annually. It was observed in two patients with tissular procedure, one patient with polypropylene stitches and the other with vycril absorbable wires and in one patient with retromuscular mesh, which has been attached with threads of polypropylene.

CHAPTER IX
Discutions

In this chapter we tried a comparation of etiopathogenic factors, intraoperative encountered problems and the high resolution of the abdominal wall defect and restoration. The study conducted at the level of the two groups of patients is supported by the literature on the influence of etiopathogenic factors involved in the occurrence of incisional hernias. The research revealed that the preperitoneal retromuscular technique hass more satisfactory postoperatively results than other studied techniques.

Patients with incisional hernias were more common in the Romanian group, following the annual parietal repairs, and in terms of sizes defect, they revealed a higher proportion of large incisional hernias. These dimensions are owed to the fact that celiotomy is still a medical act more frequently here than in civilized countries where laparoscopy precedence and the patients do not show for regular medical checks.

Length of stay is a major economic factor for hospitals. If other countries are trying minimally invasive surgical approach with an installation of closed drainage with no risk of contamination of the operative wound, in Romania this is not yet possible.

CHAPTER X
Conclusions

1. Median postoperative incisional hernias were the most common location in the two studied groups 89.9% and 84.85%, depending on surgical interventions present in the historical record, the most frequent being the laparomic one.
2. There was a decrease in the rate of relapses in using plastic procedures in both groups of patients, compared with tissular procedures.
3. Following this study, we declare in favor of using retromuscular-preperitoneal meshfor the cure of median incisional hernias, as well as the recurrent ones, due to low rates of recurrence and late complications.

4. Qualities that a prosthesis must meet are: to be mechanically adequate for the tissue, to cause enough inflammatory or foreign body reaction,not to lead or maintain the infection and not to be expensive.
5. In case of infectious history of patients wound, the prosthesis was used at an interval of at least 6 months after infection draining.
6. The study was conducted to determine the influence of prosthetic fixation methods on postoperative complications as recurrence and chronic pain. It was found that application of a retromuscular mesh without suture and attached only with fibrin glue causes a lower complications rate. Thus, the group of patients who have undergone a procedure without suture, chronic pain occurred in only one case, while in the group in which the prosthesis was sutured circumferentially postoperative pain occurred in 9 cases.