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Original Research Article

Outcome of Laparoscopic Hernia Repair with and Without Pseudo Sac Management

Foram Modh[1], Jayshriben R Majithiya[2], Bharatkumar M. Chaudhari[3], Rajeshkumar H. Majithiya[4*], Nihal Sabbirbhai Kugasia[5]

[1]Assistant Professor, Department of General Surgery, Banas Medical College and Research Institute, Palanpur

[2]Associate Professor, Department of Obstetrics and Gynaecology, Banas Medical College and Research Institute, Palanpur

[3]Associate Professor, Department of Pathology, Banas Medical College and Research Institute, Palanpur

[4]Associate Professor, Department of General Surgery, Banas Medical College and Research Institute, Palanpur

[5]Junior Resident, Department of General Surgery, Banas Medical College and Research Institute, Palanpur

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Corresponding Author: Dr. Rajeshkumar H. Majithiya

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Abstract:

Aims and Objectives: To evaluate the outcome of laparoscopic hernia repair with and without pseudo sac management.

Material and Method: The study was conducted OPD of department of surgery, Banas Medical college And Research Institute, Palanpur.

Results: Highest number of patients was 46-55 years. Mean age is 42.48±14.41 years. 96% patients were male and only 4% patients were female. 76% patients have bilateral site and 24% patients have unilateral site. 84% patients have given TAPP approach. Pseudo sac Fixation and Pseudo sac without Fixation was done 50%.

Conclusion: There is no significant pain at 48 hours and 3 month follow up in both study group. Duration of hospital stay in fixation group is also not significant. There is more urinary retention in fixative groups but not significant. Seroma formation is most significant complication in non-fixative groups. Itis statically significant. There is no recurrence.

Keywords: Laparoscopy, Hernia, Pseudo Sac Management.

Introduction

A hernia is the abnormal exit of tissue or an organ, such as the bowel, through the wall of the cavity in which it normally resides. Hernias come in a number of different types. Most commonly they involve the abdomen, specifically the groin. Groin hernias are most common of the inguinal type but may also be femoral. Other hernias include hiatus, incisional, and umbilical hernias. Symptoms are present in about 66% of people with groin hernias.

This may include pain or discomfort especially with coughing, exercise, or going to the bathroom. [1] Risk factors for the development of a hernia include: smoking, chronic obstructive pulmonary disease, obesity, pregnancy, peritoneal dialysis, collagen vascular disease, and previous open appendectomy, among others [2] Inguinal hernia affects both men and women but is much more common in Men who comprise over 90% of operated patients. A Considering both operated and non-operated inguinal hernias, the lifetime prevalence rate are 47% for men up to and including the age of 75. Repair of an inguinal hernia is one of the most common operations among adults in the western world today. The lifetime risk of undergoing such a repair is 27% for men and 3% for women. Not all inguinal hernias will require surgery, especially not those without any Symptoms. In spite of this, the reported annual number of operations in the Swedish hernia register (SHR) is approximately 17,000, which corresponds to 216/100 000 inhabitants per year. The annual number of hernia repairs in the US is approximately 800 000E. From an etiological point of view there are two types of inguinal hernia – congenital and acquired. [3]

The term congenital hernia implies a persisting processes vaginitis with free Communication between the abdominal cavity and the scrotum. In

the newborn, the frequency of a patent processus vaginalis is 57-94%. By the age of two, 37- 40% still persist and half of them may develop into an inguinal hernia later in life.

An acquired inguinal hernia is generally not believed to be associated with a persistent processus vaginalis but develops in a secondary manner (3B). Several risk factors for the development of this type of hernia have been suggested, among these various connective tissue factors. For individuals with Marfan´s and Ehlers-Danlos syndrome, cutis laxa and osteogenesis imperfecta, all of which carry an increased hernia incidence, the aetiological link to connective tissue disorders seems to be quite clear. In order to compare the results of inguinal herniarepair, a standardized classification with respect to localisation and size is needed.

Inguinal hernia most probably has been a disease ever since mankind existed. In view of its existence in different kinds of animals, and in particular of primates, one can assume that already prehistoric human beings were affected with the disease. Inguinal hernia repair has made enormous progress throughout the ages. The main reasons for intervention however remained the same: continuous growth of the inguinal and/or scrotal swelling, the risk of incarceration of the hernia content and the bad results of conservative methods like truss placement.

Hernias can only be cured by surgery. The aim is to reduce the patient's symptoms and prevent possible negative events such as incarceration without causing new problems, e.g. chronic pain or discomfort. Many different types of repair have been described during the last century. Initially, various types of tissue repairs were used to reinforce the weak part of the abdominal wall.

All these techniques implied a certain amount of tension on the suture line, an effect which may have contributed to recurrence. As a result, new "tension-free" techniques were introduced, aiming to avoid tension by the use of implant mesh. A further innovation was the development of a preperitoneal repair, first performed as an open repair and later employing various laparoscopic techniques.

Approximately 15% of all inguinal hernias are repaired endoscopically, primarily in a preperitoneal fashion (totally extraperitoneal=TEP) in which the hernia defect is covered with a prosthetic mesh that is fixed to the abdominal wall with spiral tacks, clips, or sutures. The need for fixation of the mesh is controversial. Some have suggested that fixation of mesh during endoscopic TEP inguinal hernia repair is necessary to prevent hernia recurrence. However, fixation of the mesh is thought to contribute to increase postoperative pain and the risk of nerve injury. Nerve injury has been estimated to occur in 2% to 4% of laparoscopic inguinal hernia repairs with the most commonly injured nerves being the femoral branch of the genitofemoral nerve and the lateral femoral cutaneous nerve.

This was a study of a total of 50 cases of laparoscopic inguinal hernia repair carried out at Banas Medical College And Research Institute, Palanpur

1. Outcome of laparoscopic hernia repair with and without pseudo sac management.
2. Compare pseudo-recurrences like seroma for-mation in direct hernia with and without sac fixation.

Materials and Methods

Study setting: OPD of department of surgery, Banas Medical College And Research Institute, Palanpur.

Sample size and Selection of Subjects:

The sample size has been calculated using OPEN EPI software, power 80%, Postop analgesic Use P 0.01 confidence interval is 95% using postoperative analgesic used days 2.9±5.1 in Pseudosac fixation versus 0.1±0.6 days in nonfixed study model- in Minnesota USA sample size is 25.

Inclusion criteria:

- Patients age between 18 to 70 years
- Patients willing for laparoscopic surgery
- Patients suitable for elective laparoscopic sur-gery

Exclusion criteria:

- Age <16yrs
- High anesthetic risk
- Any medical contraindication for surgery
- patients having asthma or any lung disorder

Surgical Technique

TEP or TAPP endoscopic inguinal hernia repairs would be performed with the patient under general anesthesia by using a midline, 3-trocar technique.

Polypropylene mesh would be trimmed to the appropriate size to cover the entire myopectineal orifice including the hernia defect(s). The mesh would be coated to Cooper's ligament and the anterior abdominal wall using 5 to 8 spiral tacks in patients enrolled in the tacking arm of the study.

There are two main techniques for laparoscopic inguinal hernia which are commonly used now days.

1. Laparoscopic transabdominal preperitoneal repair.
2. Laparoscopic totally extraperitoneal repair.

A number of considerations should be kept in mind in the performance of laparoscopic inguinal repair, whether via the totally extraperitoneal (TEP) approach or via the transabdominal preperitoneal (TAPP) approach.

Extreme care must be exercised in placing the mesh fixation tacks. This point cannot be overstated. A nerve injury caused by tack can be truly debilitating to the patient and very challenging to treat. Tacks should be placed only above the iliopubic tract. Proper placement may be ensured by drawing a line from the pubic tubercle to the anterior superior iliac spine (ASIS) at the start of the procedure.

Before firing each tack, carefully palpate the tacker head through the abdominal wall to ensure that it is above this line. Violation of the peritoneum during TEP repair causes loss of insufflation from the preperitoneal space into the peritoneal cavity, which, in turn, causes the preperitoneal space to collapse to some degree. This collapse can make the procedure more difficult to complete; in addition, it places intra-abdominal organs atrisk for injury and may lead to adhesion formation.

Accordingly, efforts should always be made to avoid tearing the peritoneum if at all possible. If the rent is small, endoscopic clips can be placed to close the defect and minimize the leak. Otherwise, conversion to a TAPP repair or an open repair may be necessary. Another option is to place a Verses needle through a stab incision into the abdominal cavity to drain the carbon dioxide. Trocar placement should always be done under direct vision. To prevent bleeding and hematoma formation, the trocars should be placed exactly in the midline so asto avoid tearing the fibers of the rectus abdominis. During preperitoneal dissection, the inferior epigastric artery and vein sometimes become separated from the abdominal wall and then hang down into the operative field. Clipping and dividing these vessels may be required in order to complete the procedure. It is very helpful to place the mesh in such a way as to facilitate its subsequent flush deployment. This may be accomplished by folding the mesh in half lengthwise, grasping it by the fold, and advancing it through the trocar toward the ASIS. When the grasper is released, the natural memory of the mesh causes it to spring open in a properly oriented position, without any need for time-consuming manipulation.

Vascular injury is a relatively uncommon but nonetheless potentially disastrous adverse event. It can be avoided by respecting the proximity of the femoral vessels, particularly when the mesh is being tacked to the Cooper ligament.

Recurrence of the hernia is a significant concern. The key to minimizing the recurrence rate is to use an ample-sized piece of mesh. The mesh must be large enough to extend 2 cm medial to the pubic tubercle, 3-4 cm above the Hesselbach triangle and 5-6 cm lateral to the internal ring. If the patient is male, the surgeon should always remember to pull the testes gently back down to their normal scrotal position at the end of the procedure.

Totally Extraperitoneal Repair

A 10-mm longitudinal or a curvilinear infraumbilical skin incision is made, and then deepened to separate the subcutaneous fat and expose the anterior rectus sheath.

Next, a transverse incision is made in the anterior rectus sheath slightly off the midline over the body of the rectus abdominis (thus avoiding entering the peritoneal space in the midline, where the anterior and posterior rectus sheaths merge). The midline raphe is grasped with a Kelly clamp, and the underlying rectus muscle fibers are retracted laterally, revealing the glistening white surface of the posterior rectus sheath. With the posterior rectus sheath as a guide, a dissecting balloon (or we can also use direct laparoscopic dissection instead of balloon) is introduced and slipped along the rectus sheath. The dissecting balloon is then inflated under direct laparoscopic vision (ie, with the scope in the lumen of the balloon) to dissect the preperitoneal space.

There are two techniques of dissection in TEP Balloon dissection and Direct laparoscopic dissection Telescopic dissection with laparoscope is very effective in creation of extraperitoneal space. Once adequate dissection is attained, the preperitoneal space is insufflated with carbon dioxide to a pressure of 12 mm Hg. A 10-mm 30° laparoscope is introduced through the umbilical port and a visual inspection is performed. When the preperitoneal space is properly accessed, the undersurface of the rectus muscles should be visualized at the top of the operative field.

Pre- and Postoperative Assessment

Preoperatively, patients would be asked to rate their level of pain according to a Likert scale (0=no pain to 10=most severe pain) and visual analogue scale.

Patients' level of pain, pain medications administered, and length of stay in the Post Anesthesia Care Unit (PACU) would be obtained from the medical records. Patients were assessed for pain levels, activity levels, and the use of pain medications upon return to their hospital rooms, immediately before discharge, and at 1, 4postoperatively using a standardized telephone script. The use of pain medications was categorized according to the number of doses of parenteral analgesic, oral analgesics, or oral non-narcotic pain medicines.

Result

Highest number of patients was 46-55 years. Mean age is 42.48±14.41 years. 96% patients were male and only 4% patients were female. 76% patients have bilateral site and 24% patients have unilateral site. 84% patients have given TAPP approach. Pseudo sac Fixation and Pseudo sac without Fixation was done 50%. Pain intensity had been assessed by a visual analogue scale - VAS (0 (no pain)to 10 (worst pain)). The visual analogue scale (VAS) is a subjective measure of pain. It consists of a 10cm line with two end- points representing 'no pain' and 'worst pain imaginable'. Patients are asked to rate their pain by placing a mark on the line corresponding to their current level of pain. The distance along the line from the 'no pain' marker is then measured with a ruler giving a pain score out of 10. The score can be used as a baseline assessment of pain with follow-up measures providing an indication of whether pain is reducing or not.

Table 1: Defect Size of Ultrasonography

Defect Size	No of patients
<1 cm	20 (40%)
1-2.5 cm	22 (44%)
2.5-4 cm	6 (12%)
> 4 cm	2 (4%)
Total	**50 (100%)**

Defect size was detected by pre-operative ultrasonography of inguinoscrotal region.

Table 2: Pain Score after 48 Hrs Distributions

Pain Score after 48 hrs	Pseudo sac Fixation	Pseudo sac without Fixation	No of patients
Less Pain	18 (72%)	20 (80%)	38 (76%)
More Pain	7 (28%)	5 (20%)	12 (24%)
Total	**25 (50%)**	**25(50%)**	**50 (100%)**
P value	0.5076		
Chi square	0.439		

More pain was noted in fixation groups but P value is 0.5076 which is not statistically not significant.

Table 3: Pain Score after 3 Month Distribution

Pain Score after 3 months	Pseudo sacFixation	Pseudo sac withoutFixation	No of patients
Less Pain	19 (76%)	21 (84%)	40 (80%)
More Pain	6 (24%)	4 (16%)	10 (20%)
Total	**25 (50%)**	**25(50%)**	**50 (100%)**
P value	0.4795		
Chi square	0.5		

More pain was noted in fixation groups but P value is 0.5 which is not statistically not significant.

Table 4: Complication after surgery Distribution

Complication	Pseudo sac Fixation (n=25)	Pseudo sac without Fixation (n=25)	P Value	Chi square
Urinary Retention	4 (16%)	1 (4%)	0.1572	2.14
Seroma	0	4 (16%)	**0.0371**	**4.34**

Here, post-operative seroma formation was more in non-fixation groups which is most statistically significant (0.03)

Discussion

Inguinal hernias are the most common type of hernia. The incidence is about25% in males and 2% in females. Inguinal hernia repair contributes significantly to general surgeon's workload. Since the evolution of laparoscopic inguinal hernia repair, total extraperitoneal repair (TEP) is the technique most commonly employed by laparoscopic surgeons. This technique involves placement of polypropylene mesh in the preperitoneal space. In my study Incidence of inguinal hernia was highest in the age group of years 46-55 years, showing incidence of 26%. The youngest patient in this study was 18 years old and oldest was 70 years old. The mean age incidence in the present study was 42.48 years. According to Claus CM, study mean age of patients is 50.40 years. [4] According to Reddy RRS, mean age is 47.67years. [5] In my study there are total 50 cases in which, there are 2 female patients and male patients are 48. So 96% male and 4% female. According to Claus CM et al study, [4] there are total 60 patients and 54 male and 6 female patients. According to Reddy RRS et al study, [5] there are total 30 patients in which 2

females and 28 male are included. In my study, there are, 12% Hernia on unilateral side and 38% are on bilateral side. In Claus CM et al study, [4] there are 23% unilateral hernia and 77% bilateral hernia were include. In Reddy RRS et al study, [5] there is all unilateral hernia.

In our study, we had compared 2 groups of 25 patients without pseudosac fixation and 25 patients with pseudosac fixation. We had taken this decision on randomized base for pseudosac fixation. In Zhu Y study, they had taken total 60 patients and made 30-30 patients 2 groups for comparison with pseusosac fixation and free [6]. According to Berney CR study, out of 250 patients, pseudosac was fixed by endoloop in 79 patients. [7]

This is the most new steps which were done in our institute to fix the pseudosac with different structure like pubic tubercle (72%),cooper's ligament (16%), bilateral sac was tied with each other (8%), anterior rectus sheath (4%). According to Berney CR study, they had fixed pseudosac with pubic tubercle. In Carter J and Duh QY study, they had tied pseudosac with cooper's ligament in 56 patients. [8]

In the study, we observed post-operative pain at 48 hours and at 3 month. We used visual analoug scale for measurement of pain. Pain intensity had been assessed by a visual analogue scale - VAS (0 (no pain) to 10(worst pain)). The visual analogue scale (VAS) is a subjective measure of pain. It consists of a 10cm line with two end- points representing 'no pain' and 'worst pain imaginable'. Patients are asked to rate their pain by placing a mark on the line corresponding to their current level of pain. The distance along the line from the 'no pain' marker is then measured with a ruler giving a pain score out of 10. The score can be used as a baseline assessment of pain with follow-up measures providing an indication of whether pain is reducing or not.

In our study, there is no significant difference in pain after 48 hours in patients of both group. (without fixation and with fixation group) The p-value is 0.5076 The result is significant at p <0.05.so there is no major significant difference in pain at 48 hours after operation in both the group. After 3 months, there are 19 patients with less pain (vas score <2) and 6 patients with more pain (vas score>2) in with fixation group. And there are 21 patients with less pain (vas score <2) and 4 patients with more pain (vas score>2) in without fixation group. In Claus CM et al study, patients were observed at 6 month of follow up. In which there is no significant difference in both the group after 6 month. In Panse [9] M et al study, there was no significant pain score difference between 2 groups. According to Reddy RRS, there was high pain score at 48 hours in pseudosac fixation group but in long term follow up no significant difference was noted.

Seroma formation in immediate postoperative period is known complication after endoscopic direct inguinal hernia repair. Its looks like a postoperative recurrence of hernia, as concern to patients. Seroma fluid remains trapped between the prosthetic mesh and the transversalis fascia (TF) causing, on a few occasions, a tension seroma that may require repeated follow-up visits and needle aspiration, with a potential risk of iatrogenic infection.

Incidence reported in the literature is around 4-5 %. Although techniques such as tacking the pseudo sac to Cooper Ligament or closed suction drain are described, few seem to practice any, probably because the majority of them resolve spontaneously or with repeated aspirations. Therefore, it was proposed to adopt simple measure for seroma prevention by obliterating the pseudo sac with Catgut endoloop and reduce risk of iatrogenic injury and chronic post-operative pain at its minimum.

Significant clinical factors associated with seroma formation include old age, a large hernia defect, an extension of the hernia sac into the scrotum, and the presence of a residual distal indirect sac. [10] Seroma formation is a frequent complication of laparoendoscopic mesh repair of moderate to large size direct medial inguinal hernia defects. [11]

In our study, 16% patients had developed seroma formation in non-fixative group and P value is 0.03 which suggest significant difference. Panse M et al study, [9] from 150 patients 9 patients had seroma formation on 1 month follow up but no significant result was noted. They had not aspirated the seroma fluid. We had also not aspirated seroma fluod just tight strapping can relieved within 2 days.

Conclusion

There is no significant pain at 48 hours and 3 month follow up in both study group. Duration of hospital stay in fixation group is also not significant. There is more urinary retention in fixative groups but not significant. Seroma formation is most significant complication in non-fixative groups. It is statically significant. There is no recurrence

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