

Stapling Versus Fibrin Glue for Mesh Fixation in Laparoscopic Inguinal Hernia Repair in Transabdominal Preperitoneal Technique

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Abstract

Background: Inguinal hernias are the most common hernias; they account for 90% of all spontaneous hernias. Moreover, inguinal hernia repair is the most frequently performed procedure in general surgery.

Aim of Study: The aim of this study is to compare outcomes of mesh fixation using fibrin glue versus staple in laparoscopic transabdominal preperitoneal (TAPP) repair of inguinal hernia.

Patients and Methods: This study was a prospective randomized study. It included 40 adult patients of different age group presented with unilateral inguinal hernia, admitted and undergone laparoscopic inguinal hernia repair with mesh fixation, divided into 2 equal groups. All patients undergone (TAPP) approach done at Ahmed Maher teaching hospital over a period from 2021 to 2022. It included 40 patients complaining of inguinal hernia who were fit for surgery.

Results: There was no statistical significant difference between two groups as regarding age, and also no statistical significant difference between two groups as regarding gender. Regarding the type of hernia presented in this study, we found that about 20% of patients had direct hernia and 80% patients had indirect hernia. Therefore, there was no statistical significant difference between two groups as regarding type of hernia. Regarding the intra-operative complications, our results illustrated that there was no statistical significant difference between the two groups only one case in group II had intra-operative surgical emphysema and oozing of blood during dissection.

Conclusion: Mesh fixation by fibrin glue is better than with staples as mesh fixation with glue causes less postoperative pain and less analgesia is needed. This study demonstrates that fibrin glue are well tolerated than tacks by patients and that the glues lead to the same good results during initial follow-up and in long term data. Large randomized prospective trial are required to demonstrate the real advantages of either fixation methods in presence of standardized technique and perfect knowledge of anatomy.

Key Words: *Stapling – Fibrin glue – Mesh fixation – Laparoscopic inguinal hernia repair – Transabdominal preperitoneal technique.*

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Introduction

INGUINAL hernias are the most common hernias; they account for 90% of all spontaneous hernias. Moreover, inguinal hernia repair is the most frequently performed procedure in general surgery [1].

The standard method for repairing an inguinal hernia, originally described by Bassini in 1889, is to close the inguinal canal with sutures. Due to the high recurrence rate with this technique, new methods were established that used tension-free implantation of synthetic meshes [2].

Furthermore, endoscopic/laparoscopic methods have been introduced, where the hernia canal is typically approached from the posterior side [3].

Among the various posterior techniques employing preperitoneal mesh implantation, the two most widely accepted techniques are the transabdominal preperitoneal patch plastic (TAPP) repair and the total extraperitoneal (TEP) repair [4].

Although laparoscopic repair offers a quick and less morbid way of treating hernias, complications like hematoma, seroma, neuralgia, recurrence, mesh infection, hydrocele, etc. are known [5].

The method of mesh fixation, characteristics of the mesh, irritation or injury of nerve, and nerve entrapment by fixation sutures or staples has all been examined as probable cause [6].

Usually the mesh is anchored to the pubic tubercle and Cooper's ligament by several titanium staples, by which the stability of the mesh is increased and consequently the recurrence rate of inguinal hernia repair is reduced [7].

Fibrin glue is an adhesive material that is now widely used in laparoscopic inguinal hernia repair

owing to its adhesive properties and benefits for wound healing [8].

Aim of the Work:

The aim of this study is to compare outcomes of mesh fixation using fibrin glue versus staple in laparoscopic transabdominal preperitoneal (TAPP) repair of inguinal hernia.

Patients and Methods

This is a prospective randomized study. It includes 40 adult patients of different age group presented with unilateral inguinal hernia will be admitted and undergoing laparoscopic inguinal hernia repair with mesh fixation divided into 2 equal groups all patients undergone (TAPP) approach.

Group A (n: 20 patients) underwent mesh fixation by fibrin glue, group B (n: 20 patients) underwent mesh fixation by staples. These patients presented in the outpatient clinics at Ahmed Maher Teaching Hospital, and distributed into two groups randomly.

Inclusion criteria:

- 1- Patient aged 18 to 60 years.
- 2- Inguinal hernia (direct or indirect; unilateral).
- 3- Inguinal hernia having hernia defect size between 2 and 5cm as its largest dimension.

Exclusion criteria:

- 1- Complicated (strangulated, incarcerated, obstructed, etc.) inguinal hernia.
- 2- Patient not fit for GA or pneumoperitoneum.
- 3- Femoral hernia.

Huge inguinoscrotal hernia (sac size >5 cm):

All patients will be subjected for thorough history, clinical examination. The clinical diagnosis of inguinal hernia was based on symptoms and signs elicited during clinical examination routine investigations and pelvi-abdominal ultrasound. Routine investigations were requested for all patients, including: Complete blood picture, liver function tests, fasting blood sugar, chest X-ray, coagulation profile, kidney function tests and ECG. Co-morbidities like COPD, cardiac diseases, chest diseases and diabetes mellitus were controlled preoperatively.

Operative techniques:

A- Preparation:

Abdominal and groin hair was shaved from costal margin to mid thigh. Prophylactic antibiotic

1 gram of cefalosporins was given at induction of general anesthesia. Routine 8 hours preoperative fasting. Emptying of the urinary bladder.

B- Patient position and room setup:

The patient was supine with arms tucked at the side. As extending the arms on arm boards may not allow enough room for the surgeon to comfortably operate. The Trendelenburg position allows the bowel to fall away from the pelvis, providing excellent access. The surgeon stands on the opposite side of the table from the hernia. Placement of a foley catheter is optional and depends on surgeon's preference. Place a single video monitor at the foot of the operating table. Adjust the height of the monitor for comfortable viewing by both surgeon and assistants.

C- Operative techniques of laparoscopic TAPP repair:

The patient was placed in supine position on the operating table; after general anesthesia, a routine sterilization of the entire abdominal wall, the upper thigh, penis and scrotum was performed. The surgeon stands on the side opposite the hernia, the assistant stands at the side of hernia, and the monitor was placed at the patient feet little to the side of hernia. The first trocar was placed periumbilical through 10-mm cannula and camera was inserted for initial laparoscopy, two additional trocars were inserted lateral to the rectus sheath on either side at the level of the umbilicus under direct vision through 5-mm cannula, both inguinal regions were inspected and the median umbilical ligament (remnant of the urachus), the medial umbilical ligament (remnant of umbilical artery), and the lateral umbilical fold (peritoneal reflection over the inferior epigastric artery) were identified, laparoscopic scissors were used to incise the peritoneum along a line approximately 2cm above the superior edge of the hernia defect, extending from the median umbilical ligament to the anterior superior iliac spine the peritoneal flap was mobilized inferiorly using blunt and sharp dissection.

The inferior epigastric vessels were exposed, and the pubic symphysis and lower portion of the rectus abdominis muscle were identified. Cooper's ligament was dissected to its junction with the femoral vein. The iliopubic tract was identified, but we shouldn't continue the dissection inferiorly, to avoid an injury to the femoral branch of the genitofemoral nerve and the lateral femoral cutaneous nerve, which usually enter the lower extremity just below the iliopubic tract. We had completed the dissection by skeletonizing the cord structures. In the case of direct hernia, the sac and preperitoneal

fat were reduced from the hernia orifice by gentle traction. There were two options for indirect hernias: A small sac was easily mobilized from the cord structures and reduced back into the peritoneal

cavity, A large sac may be difficult to mobilize because of dense adhesions between the sac and the cord structures due to the chronicity of the hernia.



Fig. (1): The camera (supra umbilical) and the two graspers directed toward the hernia side.

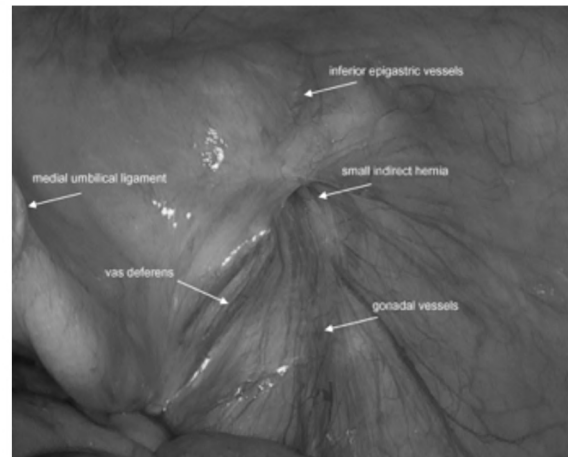


Fig. (2): Laparoscopic view of Right oblique inguinal hernia.

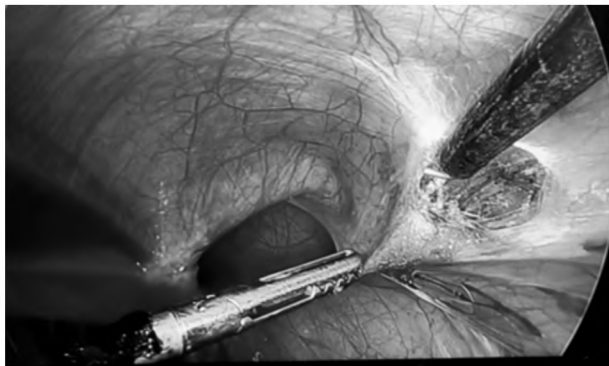


Fig. (3): Dissection of the peritoneal flap.

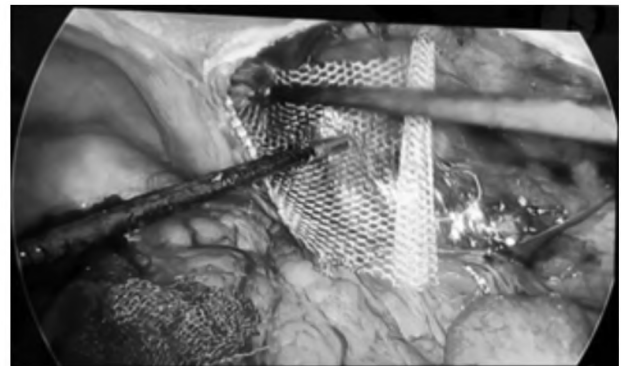


Fig. (4): Mesh insertion.

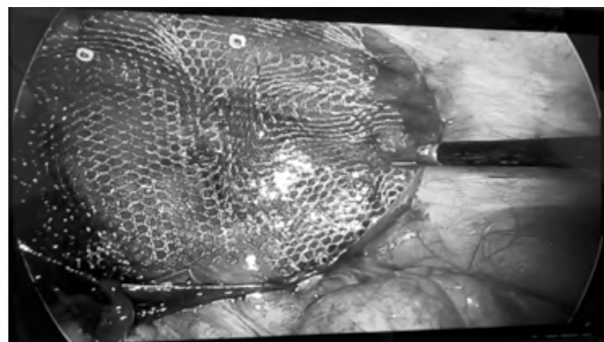


Fig. (5): Mesh fixation with tuckers.

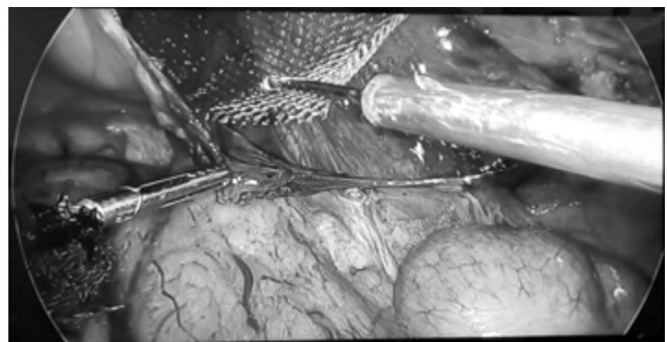


Fig. (6): Mesh fixation with fibrin glue.

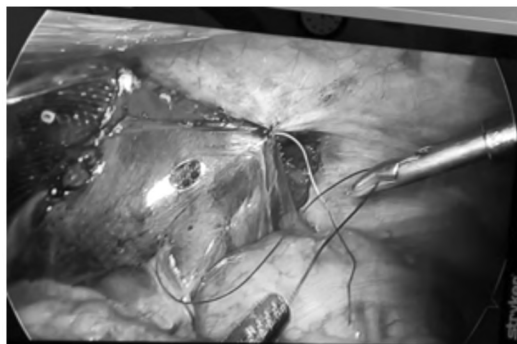


Fig. (7): Closure of the peritoneal flap.



Fig. (8): Closure of the wound.

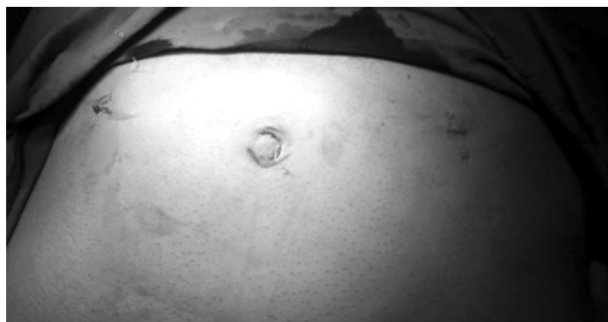


Fig. (9): Final View of the Wound.

In this situation, we circumferentially divided the sac just distal to the internal ring, leaving the distal sac in situ.

- 1- Next, we place a large piece of mesh (at least 10x 15cm) over the myopectineal orifice so that it completely covers the direct, indirect, and femoral spaces.
- 2- The superior border of the prosthesis had been fixed with staples or fibrin glue and the inferior border fixed at Cooper's ligament medially, take care do not place staples/tacks directly into pubic tubercle because chronic postoperative pain (osteitis pubis) can result.
- 3- Lateral to the internal spermatic vessels, we placed all staples/tacks above the iliopubic tract to avoid neuralgia from injury to the lateral cutaneous nerve of the thigh or the femoral branch of the genitofemoral nerve.
- 4- The peritoneal flap was closed over the mesh with staples, tacks, or continuous 3/0 Vicryl suture.
- 5- Skin closure was done by tissue glue or suture and Skin sutures will be removed after 7 days.

D- Postoperative management:

Postoperative analgesia was given I.M. 12 hours for one day followed by oral tablets on demand

later on. Antibiotic like third generation cephalosporins injection in the first 24 hours was given followed by oral antibiotics for 2 days. Patients were discharged on the second day after laparoscopic TAPP hernioplasty.

E- Follow-up:

Post-operative follow-up; the patient will be instructed to come for follow-up after operation at 1 month and 3 month intervals.

All the two groups were compared for demographic data, type of work and smoking, operative duration, intra-operative complications, postoperative pain, early ambulation, postoperative hospital stay and the mean time until return to work.

Postoperative complications including:

- A- Early complications such as urine retention, abdominal wall hematoma, subcutaneous emphysema, wound infection and seroma of inguinal canal.
- B- Late complications such as groin pain and discomfort, hernia recurrence and hydrocele of the sac remnant.

Statistical analysis:

Data were collected, revised, coded and entered to the Statistical Package for Social Science (IBM SPSS) version 20. The qualitative data were presented as number and percentages while quantitative data were presented as mean, standard deviations and ranges when their distribution found parametric. The p-value was considered significant as the following: $p > 0.05$ = Non significant (NS), $p < 0.05$ = Significant (S), $p < 0.001$ = Highly significant (HS).

Results

This study was done at Ahmed Maher teaching hospital over a period from 2019 to 2020, It included 40 patients complaining of inguinal hernia who were fit for surgery.

Table (1): Difference between the two groups regarding age.

Method	Method		Independent <i>t</i> -test	<i>p</i> -value
	Group I N=20	Group II N=20		
	Mean ± SD	Mean ± SD		
Age (years)	35.78±10.69	40.85±10.96	2.193	0.147

This table shows there was no statistical significant difference between two groups as regarding age.

Table (2): Difference between the two groups regarding gender.

Method	Method				χ^2	<i>p</i> -value
	Group I N=20		Group II N=20			
	N	%	N	%		
<i>Gender:</i>						
Male	20	100	16	80	4.4	0.106
Female	0	0	4	20		

This table shows there was no statistical significant difference between two groups as regarding gender.

Table (3): Difference between the two groups regarding operative duration.

Method	Method		Independent <i>t</i> -test	<i>p</i> -value
	Group I N=20	Group II N=20		
	Mean ± SD	Mean ± SD		
Operative time (in minutes)	46.8±5.3	47±4.4	0.450	0.680

This table shows there was no statistical significant difference between two groups as regarding operative duration.

Table (4): Difference between the two groups regarding type of hernia.

Type of hernia	=40	No	%
Direct	8		20
Indirect	32		80

About 20% of patients had direct hernia and 80% patients had indirect hernia.

Table (5): This table shows there was no statistical significant difference between two groups as regarding type of hernia.

Method	Method				χ^2	<i>p</i> -value
	Group I N=20		Group II N=20			
	N	%	N	%		
<i>Type of hernia:</i>						
Direct	4	20	4	20	0.000	1.000
Indirect	16	80	16	80		

Table (6): Difference between the two groups regarding post-operative pain.

Method	Method				χ^2	<i>p</i> -value
	Group I N=20		Group II N=20			
	N	%	N	%		
<i>Post-operative:</i>						
Severe	0	0	2	10	9.450	0.000
Mild	2	10	9	45		
No	18	90	9	45		

This table shows two cases in group II presented with severe pain postoperative while no cases presented with severe pain in group I. On the other hand nine cases in group II had mild pain in comparison with two cases in group one & this difference was statistically significant ($p=0.00$).

Table (7): Difference between the two groups regarding cost.

Method	Method				χ^2	<i>p</i> -value
	Group I N=20		Group II N=20			
	N	%	N	%		
<i>Cost:</i>						
High (1500 L.E)	20	100	0	0	40.000	0.000
Low (1100 L.E)	0	0	20	100		

This table shows: There was a statistical significant difference between two groups as regarding cost ($p=0.00$).

Table (8): Difference between the two groups regarding intra operative complication.

Method	Method				χ^2	P-value
	Group I N=20		Group II N=20			
	N	%	N	%		
<i>Intra operative complication:</i>						
Yes	0	0	1	5	1.030	0.310
No	20	100	19	95		

This table shows there was no statistical significant difference between the two groups as regarding intraoperative complication one case in group II had intraoperative surgical emphysema and oozing of blood during dissection.

Table (9): Difference between the two groups regarding post-operative hospital stay.

Method	Method				χ^2	P-value
	Group I N=20		Group II N=20			
	N	%	N	%		
<i>Hospital stay:</i>						
One day						
More than	20	100	17	85	3.240	0.070
One day	0	0	3	15		

This table shows there was no statistical significant difference between two groups as regarding of postoperative hospital stay. But in group II three cases stayed more than one day as they were complaining of pain and scrotal edema.

Table (10): Difference between the two groups regarding post operative wound infection.

Method	Method				χ^2	P-value
	Group I N=20		Group II N=20			
	N	%	N	%		
<i>Wound infection:</i>						
Yes	20	100	19	95	1.030	0.310
No	0	0	1	5		

This table shows there was no statistical significant difference between two groups as regarding wound infection.

Table (11): Difference between the two groups regarding post operative recurrence.

Method	Method				χ^2	P-value
	Group I N=20		Group II N=20			
	N	%	N	%		
<i>Post-operative recurrence:</i>						
Yes	0	0	1	5	1.026	0.311
No	20	100	19	95		

This table shows there was no statistical significant difference between the two groups as regarding recurrence there is no recurrent cases in group I and one case in group II.

Discussion

Hernia is a protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity. Inguinal hernias are the most common hernia; they account for 90% of all spontaneous hernias. Moreover, inguinal hernia repair is the most frequently performed procedure in general surgery [9].

The standard method for repairing an inguinal hernia, originally described by Bassini in 1889, is to close the inguinal canal with sutures. Owing to the high recurrence rate with this technique, new methods were established that used tension-free implantation of synthetic meshes [10].

With the revolution in laparoscopic surgery in 1990 came the development of inguinal hernia repairs using the introduction of mesh through a laparoscope. There are two major laparoscopic approaches, the transabdominalpreperitoneal repair (TAPP) and the total extraperitoneal repair (TEP) [11].

There are many indications for both techniques, but the TAPP repair is particularly recommended for recurrent hernias and difficult hernias (sliding or incarcerated hernias). The TAPP repair has the advantage that it is easier to perform, learn, can be better standardized, and offers the possibility to perform a diagnostic laparoscopy [12].

In general, the TAPP repair is easier to learn than the TEP. Most randomized studies that compared laparoscopic with open repair found that laparoscopy was associated with less postoperative pain, earlier return to work, higher costs, a longer operating time, a longer learning period, and a

higher recurrence and complication rate during the early learning phase [13].

In TAPP repair mesh fixation can be done through different methods such as tacker clips, fibrin glue, suturing, self-adhesive mesh or leaving mesh without fixation. There is less postoperative pain and more rapid recovery after glue fixation than after staple fixation, without any significant difference in recurrence rate [14].

Inguinal hernia is the commonest problem among all external hernias and surgery for inguinal hernia is one of the most common procedures performed in a general surgical service, accounting for approximately one third of all interventions. Although many patients are asymptomatic, most of them have local symptoms and, if left untreated, hernia itself has potential complications such as irreducibility, incarceration, strangulation, peritonitis, and sepsis. Since inguinal hernia repair represents one of the most frequently performed surgical procedures, mesh repair is accepted as a gold standard in inguinal hernia repair worldwide [15].

The laparoscopic operations caused significantly less pain in the early postoperative period, leading to earlier mobilization and earlier return to work than open mesh repair. This was clearly seen in the manual workers who have undergone laparoscopic operation [16].

Laparoscopic TAPP has the following potential advantages; The ability to treat bilateral hernia, Easier repair of recurrent hernia because repair is done in tissues that have not been previously dissected, Less postoperative pain and discomfort, Reduced recovery time allowing early return to full activity, The highest possible ligation of the sac, and Improved cosmesis.

One of the controversies in TAPP is how to fix the mesh. Mesh can be fixed either by fibrin glue, tucker clips or leaving the mesh without fixation [17].

There have been a large number of studies of comparison of fibrin glue versus stapled fixation in laparoscopic repair of inguinal hernia published in the last decade.

Our results showed that there was no statistical significant difference between two groups as regarding age, while there was also no statistical significant difference between two groups as regarding gender.

We found that the mean operating time was 46.8 ± 5.3 in group 1 and for group 2 was 47 ± 4.4

and there was no statistical significant difference between two groups as regarding operative duration.

This difference was statistically insignificant in agreement with Lau et al. [17] who mentioned that the mean operative duration for laparoscopic TAPP inguinal hernioplasty was about 45min.

Regarding the type of hernia presented, we found that about 20% of patients had direct hernia and 80% patients had indirect hernia. Therefore, there was no statistical significant difference between two groups as regarding type of hernia.

Some reports demonstrate better short-term pain results in patients who underwent TAPP repair with fibrin glue versus staple fixation. Placing a tack in anatomical in the "no go" regions is very dangerous; it is represented by the triangle of doom and the triangle of pain [18] observe that if we placed a tack on the pubic tubercle will invariably lead to a high percentage of postoperative pain. Fibrin glue application was to avoid these complications.

In the analysis of post-operative pain occurrence in this study, we found that two cases in group II presented with severe pain postoperative while no cases presented with severe pain in group I. On the other hand nine cases in group II had mild pain in comparison with two cases in group I & this difference was statistically significant ($p=0.00$), which agrees with the study of [19] who reported that postoperative pain is less in fibrin glue fixation than with staples.

While in disagreement with our study, some studies demonstrate high rate of chronic pain as Kumar et al. [20].

While for the cost afforded by patients, There was a statistical significant difference between two groups as regarding cost ($p=0.00$).

Cost is the other issue that needs to be considered while using tackers and our study indeed showed tackers cost additional money compared to fibrin glue. Several meta-analyses and RCTs have shown that fixation of mesh with fibrin glue leads to decreased cost [20].

Regarding the intra-operative complications, our results illustrated that there was no statistical significant difference between the two groups as regarding intraoperative complication one case in group II had intraoperative surgical emphysema and oozing of blood during dissection.

This agrees with McComark et al. [22] having said that, intraoperative complications such as surgical emphysema was insignificant as expected after gas insufflation and resolved spontaneously in the two groups.

For the post-operative hospital stay, there was no statistical significant difference between two groups as regarding of postoperative hospital stay. But in group II three cases stayed more than one day as they were complaining of pain and scrotal edema.

These results agree with the results of Cheah et al. [23] having said that postoperative hospital stay in group I whose mesh was fixed by using fibrin glue was 1 day, but in group II whose mesh was fixed by staples, two cases have stayed for more than 1 day.

While regarding the post-operative wound infection, there was no statistical significant difference between two groups as regarding wound infection, and for the recurrence there was no statistical significant difference between the two groups as regarding recurrence there is no recurrent cases in group I and one case in group II.

The recurrence that occurred in group II may be due to mesh migration or may be due to not fixing the mesh; this agrees with the result of Andersson et al. [19] who reported that there was no recurrent case in group I (0%) in which the mesh was fixed by fibrin glue and one case recurrent in group II (10%) in which the mesh was fixed by staples.

Meta-analyses have also comprehensively concluded that the recurrence rates are not increased by non-fixation of the mesh. Moreover, the non-fixation procedure can avoid the risk of vessel and nerve injury associated with tacker fixation. Post-operatively within two weeks, the proliferation of mesenchymal cells occurs in the mesh, and in the next two months, the tissue starts to incorporate into the mesh and adequate amount of collagen develops. This eventually strengthens permanent stabilization of mesh in the preperitoneal area [24].

Several methods of mesh fixation have been described and practiced such as surgical adhesives (Fibrin glue), self-fixating mesh and mechanical fixation (Tackers or sutures). The main reason for fixation is to avoid migration and theoretical recurrences. However, the use of fibrin sealant may lead to fibrin glue reactions, but many studies have proven its efficacy as safe [25].

Suture fixation is barely practiced as it is time-consuming and has not shown any benefits over non-fixation or tacker fixation. Tackers are the most common method of mesh fixation. They can be both absorbable and non-absorbable. The main concerns are post-operative acute and chronic pain due to greater risks of nerve injury [26].

The use of fixation devices in the conjoint tendon or the pubic tubercle can be a causative factor for postoperative pain and discourage early ambulation. Approximately 2-16% of patients may experience persistent pain after laparoscopic inguinal hernia repairs [27].

A very important finding in this study was that the non-fixation of mesh did not lead to increased recurrence. This is in agreement to the results of randomized trials and meta-analysis looking at non-fixation of mesh [28].

Moreover, the superiority of non-fixation method in terms of avoiding potential nerve damage as well as limiting surgical expenses has been acknowledged.

Conclusion:

Mesh fixation by fibrin glue is better than with staples as mesh fixation with glue causes less postoperative pain and less analgesia is needed. This study demonstrates that fibrin glue are well tolerated than tacks by patients and that the glues lead to the same good results during initial follow-up and in long term data. Large randomized prospective trial are required to demonstrate the real advantages of either fixation methods in presence of standardized technique and perfect knowledge of anatomy.

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دراسة مقارنة بين تثبيت الشبكة الجراحية باستخدام الدباسة في مقابل الغراء أثناء عملية إصلاح الفتق الأربي بالمنظار

تضمنت هذه الدراسة ٤٠ مريضاً بالغاً من فئات عمرية مختلفة تم علاجهم بفتق إربي من جانب واحد، وهي دراسة عشوائية مستقبلية، حيث تم قبولهم وخضوعهم لإصلاح الفتق الإربي بالمنظار مع تثبيت الشبكة مقسمة إلى مجموعتين متساويتين، جميع المرضى أجروا هذه الجراحة في مستشفى أحمد ماهر التعليمي في الفترة من ٢٠٢١ وحتى عام ٢٠٢٢ تراوحت أعمار المرضى بين ١٨-٥٥ سنة. وقد تمت متابعة المرضى من خلال الفحص السريري الروتيني لمدة ٦ أشهر إلى ١٢ شهراً لتحديد معدل حدوث الارتجاع في كل مجموعة.

الهدف من هذه الدراسة هو مقارنة نتائج تثبيت الشبكة باستخدام غراء الفيبرين مقابل استخدام الدباسة في إصلاح الفتق الإربي بالمنظار عبر البطن.

أظهرت نتائج هذه الدراسة عدم وجود فروق ذات دلالة إحصائية بين مجموعتين من حيث العمر، بينما لم يكن هناك فرق ذو دلالة إحصائية بين مجموعتين من حيث الجنس. وجدنا أن متوسط مدة العملية الجراحية كان ٥٠.٣ ± ٤٦.٨ في المجموعة ١ وللمجموعة ٢ كان ٤٠.٤ ± ٤٧ ولم يكن هناك فرق ذو دلالة إحصائية بين مجموعتين فيما يتعلق بمدة العملية، فيما يتعلق بالمضاعفات أثناء العملية، أوضحت نتائجنا أنه لا يوجد فرق ذو دلالة إحصائية بين المجموعتين فيما عدا حالة واحدة في المجموعة الثانية تعاني من انتفاخ الرئة الجراحي أثناء العملية ونزف الدم أثناء التشريح. بالنسبة للإقامة في المستشفى بعد الجراحة، لم يكن هناك فرق ذو دلالة إحصائية بين المجموعتين. لكن في المجموعة الثانية، بقيت ثلاث حالات أكثر من يوم واحد حيث كانوا يشكون من ألم ووذمة كيس الصفن.

وأخيراً فيما يتعلق بعدوى الجرح بعد الجراحة، لم يكن هناك فروق ذات دلالة إحصائية بين المجموعتين. وبالنسبة لارتجاع الفتق لم يكن هناك فرق ذو دلالة إحصائية بين المجموعتين فيما عدا حالة واحدة في المجموعة الثانية.