

Sublay versus onlay mesh repair of ventral hernia

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الخلاصة

حالات الفتق الجراحي وفتق حول السرة كثيرة الحدوث. على الرغم من تعدد الطرق في إصلاح الفتق الجراحي وفتق حول السرة تبقى طريقة الإصلاح بواسطة وضع شبكة هي الطريقة المثلى.

حللت مجموعة الدراسة المتكونة من 102 مريض بدراسة مستقبلية 52 مريضاً عولجوا بواسطة وضع شبكة تحت غلاف عضله البطن المستقيمة 50 مريضاً بواسطة وضع شبكه فوق عضله البطن المستقيمة ألمده المستغرقة لإكمال العمليه ومضاعفات بعد العمليه.

الوقت المستغرق لإكمال عمليه إصلاح فتق جراحي 65 – 120 دقيقة بطريقه وضع شبكه تحت غلاف عضله البطن المستقيم مقارنة ب 50 – 90 دقيقة بطريقه وضع شبكه فوق عضله البطن المستقيمة. معدل حدوث تجمع السائل المصلي 2% بطريقه وضع شبكه تحت عضله البطن المستقيمة مقارنة ب 24 % بطريقه وضع شبكه فوق عضله البطن المستقيمة. الاختلاجات كانت 2 % بطريقه وضع شبكه تحت عضله البطن المستقيمة مقارنة ب 4 % بطريقه وضع شبكة فوق عضله البطن المستقيمة. لم يحدث تكرار بطريقه وضع شبكه تحت عضله البطن المستقيمة مقارنة بحدوث رجوع واحد بطريقه وضع شبكه فوق عضله البطن المستقيمة بعد متابعه المرضى لمدة 12 إلى 24 شهراً.

إصلاح الفتق الجراحي وفتق حول السرة بطريقه وضع شبكة تحت غلاف عضله البطن المستقيمة هي الطريق المثلى.

Abstract

Ventral hernias are commonly encountered in surgical practice. The estimated incidence of ventral hernia is 15-20%. Although a wide variety of surgical procedures have been adopted for the repair of incisional hernia, but the implantation of prosthetic mesh remains the most efficient method of dealing with ventral hernia. Our study is to evaluate the technique of preperitoneal (sublay) mesh repair of ventral hernias and compare it to onlay mesh repair. The prospective study was carried out in 102 patients of incisional and paraumbilical hernia. 52 patients were managed by onlay mesh repair and 50 patients were managed by sublay mesh repair.

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Observation in both groups were made with regards to duration and ease of operation, placement and duration of drainage, wound complications, hospital stay, and recurrence. Follow up every three month for 12-24 months was done .

In onlay group drain was removed after 2-5 days except one patient with large incisional hernia drain was removed after 14 days .In sublay group drain was removed after 2-3 days. Post operative complications like seroma & wound infection were comparable in both groups. In sublay group Seroma formation was 2%(one patient only) . Wound infection was 2% (one patient only).No septic mesh was removed in the series. In onlay group seroma formation was 24%(12 patients) most of seroma occur in large incisional hernias repair, wound infection was 4% (2 patients) and one septic mesh was removed. In sublay recurrence rate was 0%, in onlay recurrence rate was 2%(one patient).

Conclusion

Sub lay mesh repair is associated with less chances of seroma formation and almost no recurrence with low post operative complication like infection and wound edge necrosis.

Introduction

Ventral hernias are commonly encountered in surgical practice. The estimated incidence of ventral hernia is 15-20%¹.

Incisional hernias, by definition, develop at sites where an incision has been made for some prior abdominal procedure.

Hernias are due to failure of fascial tissues to heal and close following laparotomy.

Any condition that inhibits natural wound healing will make a patient susceptible to the development of an incisional hernia.

Such conditions include: infection, obesity, smoking, medications such as immunosuppressive, excessive wound tension, malnutrition, fractured sutures, poor technique, and connective tissue disorders². Emergency surgery increases the risk of incisional hernia formation.

It is estimated that an incisional hernia will develop in approximately 10 to 15 percent of abdominal incisions^{2,3}, and in up

to 23 percent of patients who develop postoperative wound infection⁴.

Such hernias can occur after any type of abdominal wall incision, although the highest incidence is seen with midline incisions, the most common incisions for many abdominal procedures⁴.

Even the smallest incisional hernia has the potential for incarceration and, therefore, repair should be considered.

Hernias that are less likely to incarcerate include upper abdominal hernias, hernias less than 1 cm in diameter, and hernias larger than 7 to 8 cm (where loops of bowel can move in and out of the hernia sac without restriction, and are therefore less likely to become incarcerated⁵).

Paraumbilical hernia is a protrusion through the linea alba just above or below the umbilicus, if the hernia is untreated it increase in size and more and more of its contents become irreducible eventually strangulation may occur thus operation should be advised in nearly all cases⁵.

As a result of high recurrence rate in the repair of ventral hernia, various types of repairs have been used both anatomical and prosthetic.

But the results have been disappointing with a high incidence of recurrence of about 30-50% after anatomical repair⁵ and 1.5-10% following prosthetic mesh repairs⁶.

The introduction of prosthetics had been revolutionized hernia surgery with the concept of tension free repair.

Although a wide variety of surgical procedures have been adopted for the repair of incisional hernia, but the implantation of prosthetic mesh remains the most efficient method of dealing with ventral hernia⁷.

The prosthetic mesh can be placed between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath (onlay mesh repair) as well as in the preperitoneal space (sublay mesh repair).

The preperitoneal (sublay) mesh hernia repair was first described by Renestopa⁸ Jean Rives⁹ and George Wantz¹⁰. This technique is

considered by many surgeons to be the gold standard for the open repair of abdominal incisional hernia^{11,12,13,14} (sublay mesh repair).

Aim of study

To evaluate the technique and complications of preperitoneal (sublay) mesh repair of ventral hernias and compare it to onlay mesh repair

Patients and methods

The prospective study was carried out in 102 patients of incisional and paraumbilical hernia admitted in department of Surgery in Basrah general hospital from 1st January 2008 to 1st January 2010, excluding very large incisional hernia with defect more than 10 cm.

In our study 36 cases of incisional hernias and 16 cases of paraumbilical were managed by sublay mesh repair and 37 cases of incisional hernia and 13 cases of paraumbilical hernia were managed by sublay mesh repair .

Observation in both groups were made with regards to duration and ease of operation, placement and duration of drainage, wound complications, hospital stay, and recurrence. Follow up every three month for 12-24 months was done .

Procedure (sublay repair) began with excision of the old scar the hernial sac was dissected to expose the edge of the defect. Here mesh (Polypropylene) was placed broadly under the defect in the retro muscular layer of the abdominal wall. The mesh extended well beyond the under edges of the defect (about at least 4-5 cm).

The center of the mesh was marked by stitch to avoid mal alignment of the mesh and the mesh was fixed to the peritoneum by multiple stitches.

Organs within the abdomen are protected from injury by the mesh by a peritoneum. Adhesions to intestine are there by avoided. The edge of sheath approximated over the mesh by non absorbable nylon suture.

Suction drains, were placed for incisional hernia and large paraumbilical hernia > 4cm only for 2-3 days.

In onlay repair the mesh was placed over the sheath of muscle after approximation the edges of sheath. Mesh was fixed to the rectus sheath by multiple interrupted sutures and Redivec suction drains, were placed for most cases except small paraumbilical hernias were drain not placed & dead space obliterated by tight dressing over the wound at the end of operation.

All operations were carried out under general anesthesia with antibiotic prophylaxis of 3rd generation Cephalosporin, 2 grams daily for initial 2-3 days.

The rationale for using 3rd generation Cephalosporin was to provide the prophylactic coverage for both gram positive and gram negative organisms .

Data were analyzed using SPSS 18.0 software with ,Fisher's exact test as appropriate ; $p < 0.05$ was considered to be statistically significant.

Results

The time for surgery in sublay group was (65 – 120) minutes compared to (50 – 90) in onlay group for incisional hernias and (50-90) min in sublay group compared to (40-65)min for paraumbilical hernia.

Suction drain was put in all cases of incisional hernias repair in sublay group drain was removed after 2-3days.

In onlay drains was put in all cases of incisional hernias and paraumbilical hernias (except 8 patients with small para umbilical hernias less than 4 cm) .

In onlay group drain was removed in 2nd to 5th day except one patient with large incisional hernia drain was removed in 14th day .

Post operative complications like seroma & wound infection were comparable in both groups.

In sublay group Seroma formation was 2%(one patient only) . wound infection was2% (one patient only).

No septic mesh was removed in the series.

In onlay group seroma formation was24%(12 patients) most of seroma occur in large incisional hernias repair, wound infection was 4% (2 patient s)and one septic mesh was removed.

In sublay recurrence rate was 0%,in onlay recurrence rate was 2%(one patient).

Wound edge necrosis occur in one case of onlay repair which was managed by excision of necrotic edge & primary suturing and no case of flap edge necrosis occur in sublay group.

Table (1) : Age and sex distribution

Age	Male	Female	Total	Percent
15-35	4	16	20	19.6%
36-55	6	25	31	30.4%
56-70	10	41	51	50%

Table (2):Type of hernia

Type of hernia	No. of patients	Percent
Incisional hernia	73	71.5%
Paraumbilical hernia	29	28.5%

Table (3):Original operations for patients with incisional hernia

Type o surgery	Number	Percent
Bowel related	32	43.8%
Gynaecological	36	49.2%
Cholecystectomy	3	4%
Renal surgery	2	3%

Table (4):Post operative complications

Postoperative complication	Onlay group	Sublay group	P value
Seroma	12	1	0.002
Wound infection	2	1	1.00
Mesh removal	1	0	1.00
Recurrence	1	0	1.00
Flap necrosis	1	0	0.495

Discussion

Ventral hernia in the anterior abdominal wall includes both spontaneous and most commonly incisional hernias after an abdominal operation.

Small hernias less than 2.5 cm in diameter are often successfully closed with primary tissue repairs however larger ones have

recurrence rate of up to 30 – 40 % when a tissue repair alone is performed¹⁵.

Hernia recurrence is distressing to patients and embarrassing to surgeons.

Primary tissue repair is associated with higher unacceptable recurrence rate. Nowadays tension free mesh repair is ideal hernia repair technique¹⁶.

The prosthetic mesh can be placed between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath (onlay mesh repair) as well as in the preperitoneal (sublay mesh repair).

The latter technique has several advantages one of being not transmitting the infection from subcutaneous tissues down to the mesh as it lies quite¹⁷.

Increased intra-abdominal pressure acting anteriorly on the margins tends to oppose the mesh to the abdominal wall rather than distracting it.

In our study the time taken for operation was compared with 65-120 min in sublay group compared to 50-90 min in onlay group for incisional hernias and 50-90min in sublay group compared to 40-65min in onlay group for para umbilical hernia.

The difference of time can be accounted due to more dissection needed for creating preperitoneal space.

In our study no significant difference was found regarding the recurrence rate. The recurrence rate of preperitoneal (Sublay) mesh repair mentioned in different series varies from 2% to less than 10%¹⁸.

Post operative complication, regarding seroma formation had significant difference with 2% in sublay compared with 24% in onlay group with $p < 0.05$.

In this study, the incidence of seroma was 2% compared with 2.7% in local series and 5% to 7.6% in another study¹⁹.

Other post operative complication like wound infection, mesh removal, wound edge necrosis had no significant difference.

The incidence of major wound infection in this study is 2% which is quite comparable to international studies²⁰.

Hospital stay in sublay group was 2-4 days compared to 2-6 days in onlay group .

Conclusion

Sub lay mesh repair is associated with less chances of seroma formation and almost no recurrence with low post operative complication like infection and wound edge necrosis.

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