

THE USE OF PROSTHETIC MESH IN BIG VENTRAL POSTOPERATIVE HERNIA REPAIR⁺

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Abstract:

Big abdominal postoperative hernia remains a challenge for surgeons as it usually needs tension on margins of the abdominal wall defect during closure ; besides , factors that predispose to the development of incisional hernia are relative contraindications to repair. In this study the prosthetic mesh was used to evaluate the benefits of its use in such difficult cases.

Thirteen selected patients with big ventral postoperative hernia were underwent herniorrhaphy by onlay prosthetic mesh repair , from March 1996 till January 2003. The criteria for selection were inability to close the abdominal wall defect without tension, and the patients were followed up for at least one year after the operation.

After the operation there was marked improvement in respiration , abdominal movement and the shape of the abdomen , especially in standing position . All these patients were followed up for at least one year after the operation , and no recurrence was found, with exception of one patient (7.69 %) who had recurrence after eight months from the operation .

It was found that the use of prosthetic mesh in repair , gave good results , that coincids with the other reported results (recurrence less than 10 %), and the main reason for low recurrence rate is the " tension – free " repair .

المستخلص:

أجريت عمليات ريافة الفتوق الجراحية الأمامية للبطن لثلاثة عشر مريضاً للفترة من آذار ١٩٩٦ إلى كانون الثاني ٢٠٠٣ ، باستخدام الشبكة البديلة . وقد تم اختيارهم للمواصفات التالية : عدم إمكانية غلق فتحة الفتق بدون شد (توتير) للعضلات ، و متابعة المرضى لمدة عام على الأقل. وقد تم إعطاء المرضى مضادات حيوية احترازية ، قبل العملية ولمدة عشرة أيام بعد العملية . وقد أدت العملية إلى تحسن في التنفس وأداء عضلات البطن للمريض وتحسن في منظر البطن خاصة في الوقوف . ولم يحدث رجوعاً للفتق (انتكاس) خلال سنة بعد العملية ، إلا في مريض واحد (٧،٦٩ %) الذي حدث بعد ثمانية أشهر من العملية .

لقد تبين أن استخدام الشبكة البديلة في ريافة هذه الفتوق يعطي نتائج جيدة ، تتفق مع النتائج المنشورة في الدوريات (أقل من ١٠ % خلال سنة من المتابعة بعد العملية) ، و السبب الرئيسي للنسبة القليلة لرجوع الفتق بعد الريافة بهذه الطريقة هو عدم وجود شد على مكان الريافة .

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Introduction:

Incisional hernia is a diffuse extrusion of the peritoneum and the abdominal content through a weak scar after an operation or accidental wound [1]. Ventral – abdominal postoperative hernia represents the major type of incisional hernia [2]. A large incisional (abdominal) hernia produces paradoxical respiratory abdominal movement similar to that of a flail chest, and causes respiratory dysfunction [3]. Large hernias are unsightly, especially in standing, with abdominal discomfort, and may predispose to incarceration and strangulation[4]. Incisional is revealed only when the patient is asked to lift the legs off the examination couch, to sit up, or to cough.

The time of development of incisional hernia differs from center to center, but mostly occurs within first year of the operation (75% - 90%), and the incidence of incisional hernia ranges between (7.5% - 13%) of major laparotomy wounds [5]. The predisposing factors for the development of incisional hernia, and pathophysiology are explained in textbooks of surgery [1,2,3,4,5]. Unfortunately, factors that predispose to the development of incisional (ventral) hernias are relative contraindications to repair[4].

The defect of ventral hernia may be repaired in the same way as a laparotomy wound, with a mass closure, or using Keel or Mayo's technique, or it may be repaired with a darn of nylon [4,6,7]. But, all these have failure rate of 40% for sutured (primary) repairs, where the defect is brought together under tension [4,6]. On the other hand 'tension – free' repairs, using prosthetic mesh have a much lower failure rate at 10% or less [4,6,7].

The first use of mesh was in 1940s, and is made of tantalum metal, but metal fatigue caused fragmentation of this material which was followed by recurrence, skin sinuses, and bowel fistulae. Later, in 1980s, the surgeons used polytetrafluoro-ethylene (PTFE) and polypropylene mesh which cause little tissue reaction, extremely strong, non-toxic, resisting aging and fatigue, and are not easily infected [7].

Patients and Methods:

Thirteen patients with big ventral postoperative hernia, were selected during the period from March 1996 till January 2003. The criteria for selection were: fitness for operation under general anaesthesia, failure of approximation of the abdominal wall defect without tension, and following up the patient for at least one year after the operation.

Nine of these patients were male, the age range of all patients was between (20 – 48) years. All these patients had previous laparotomy which was followed by incisional hernia. All these patients had undergone careful evaluation and fitness for operation. And there was no signs of local infection at their abdomen preoperatively.

The repair of their ventral – abdominal hernia by using onlay prosthetic mesh (polypropylene or PTFE) was done by the author, and fixation of the mesh to the abdominal wall by nonabsorbable - prolene. The technique of the operation is written in the textbooks of surgery [4,6,7].

All patients have no, preoperative, local infection; yet a broad spectrum third generation cephalosporin was given to them, one hour before operation, and continued for ten days after the operation.

Results:

Early postoperative complications were abdominal pain, restriction of abdominal movements (the patients feel that their abdomen is rigid), and dry cough.

Two male patients, (40 & 48) years old, had retention of urine (15.38%), needed catheterization for two days, with no subsequent sequelae. The drains were removed in the third postoperative day, when less than 20 ml./day came out. No local signs of infection at site of the operation. Five patients were discharged in the fourth postoperative day, others in the fifth postoperative day.

All patients were followed up for one year at least, with no signs of local infection. But one patient (7.69%) had small recurrence in lower part of the operative site after 8 months from the operation, due to his old hobby of vigorous work in his farm and he refused further operations but he maintained weight reduction with light work, with no subsequent increase in the recurrent hernia, or complications. The remaining twelve patients have improvement in their abdominal respiration and abdominal shape, especially in standing position. Also they have better daily activity, but without vigorous heavy exercises.

Discussion:

The 'tension – free' suture is the corner stone in hernia repair. It was found that sutured repairs for postoperative ventral-abdominal hernia, are followed by 40% recurrence (failure) rate, and the main cause is 'tension' by contraction of abdominal muscles that pull the sites of sutures outside or laterally with subsequent tear at repaired sites. While 'tension – free' repairs with prosthetic mesh have lowered this rate to 10% [4,6,8,9]. The rarity of incisional hernia claimed by others, may be because patient follow up is not done meticulously and carefully, and specifically examined for the presence of a hernia [5].

American surgeons are very concerned with 'tension-free' hernia repair to the degree that in 1996, over 50% of all groin hernia repairs incorporated a mesh prosthesis as part of the repair [10].

Also, cost analysis showed that mesh repair of incisional hernia produced lower costs (totally) than primary repair [11].

To obtain good analysis of repair with mesh, necessitates follow up of the patients by the surgeons who did the operations for them, to correlate all preoperative, operative, and post-operative factors together. In this study, all patients who were not followed up for at least one year after operation were not included in this study.

Antibiotic chemoprophylaxis is useful in abdominal incisional herniorrhaphy with implantation of prosthetic material for reducing local septic complications [12]. In this study, no comparison is made between the antibiotics used here with other studies as this is not the aim of this study, yet a broad spectrum antibiotic was given preoperatively and was continued for ten days postoperatively, no significant local infection was found. But, one year follow up is not enough, because infection may occur after years from the operation, as mesh is non-absorbable foreign material [7]. In addition, concern exists about development of adhesions between viscera and mesh, which predispose to intestinal obstruction,

especially with polypropylene which showed considerable peritoneal adhesions[13,14] .

The recurrence of hernia, in this study (7.69%), is within the range that was mentioned in major studies[4,6,7,8,9] . The cause of recurrence is vague , and it needs numerous studies about the pathophysiology of collagen metabolism and its interaction with the pores of the mesh, which is very complex mechanism due to interference of many factors[5] . Knowing that fibrous tissue grows through the pores of the mesh and invades it , which is eventually incorporated into the body in a strong and pliable collagen sheet .

Conclusions and Recommendations:

The use of prosthetic mesh is very useful to repair big ventral postoperative hernia , minimize symptoms and prevent complications of the hernia like strangulation and respiratory dysfunction , with low incidence of recurrence (failure) rate . There must be no local infection , and administration of suitable prophylactic antibiotic is preferable . Follow up of the patients for years , preferably by the same surgeon(s) who did the operation , is good for meticulous analysis of this diligent operation .

Collagen metabolism and its integration with the pores of the mesh is complex mechanism and needs further studies .

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