Post-Operative Complications After Repair Of Incisional Hernia

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الملخص

الخلفية: بتردد يلاقي الجراح,الفتق الجراحي لكونه يحصل في(3.8-11.5%)مابعد عمليات فتح البطن علما ان رتق الفتق الجراحي الكبير هي عملية صعبة ومهددة بعودة الفتق ثانية.هنالك عدة طرق لاصلاح الفتق الجراحي تتراوح من المقابلة البسيطة بطبقة واحدة الى المقابلة المعقدة مع استخدام الشبكة المصنعة.

ان هدف هذه الدراسة هو بيان الخبرة في استخدام الشبكة لرتق الفتق والعوامل التي تؤثر على المضاعفات عقابيل عمليات رتق الفتق الجراحي.

الطرق: مابين كانون الثاني 2011كانون الاول2013 أخضع مئة وعشرة مرضى اجريت لهم عمليات رتق الفتق الجراحي بالشبكة لدراسة مستقبلية في قسم الجراحة العامة في مستشفى الحسين التعليمي .

تم ادراج التاريخ المرضي لكل مريض كالاصابة بداء السكري واستخدام ادوية الستيرويدات ومعرفة العملية السابقة وهل ان الفتق جديد اوعائد وتم اجراء الفحص الشامل مثل الوزن والطول لكل مريض مع تحديد حجم الفتق وتحديد العقارات الواقية فيما اذا تم اعطاءها ام لا ونوع وحجم الشبكة المستخدمة والمضاعفات الحاصلة اثناء وبعد العملية ومدة المكوث في المستشفى.

النتائج: مئة وعشرة مرضى كان بينهم (62) انثى و(48)ذكرا ومتوسط العمر هو(45.5)سنة للاناث و(58)سنة للذكور. (31)مريض كان يعاني السمنة و (48)مريض مصاب بداء السكري, (24) مريض كان يستخدم عقار الستيرويد .

العملية السابقة في اغلب المرضى كانت متعلقة بالمعي وتليها عمليات الاجهزة التناسلية الانثوية,الجرح السابق كان في الغالب وسطي طولي في البطن .عشرون من المرضى كان لديهم رتق سابق للفتق لمرة واحدة (13) لمرتين ,خمسة مرضى لثلاث مرات ومريض واحد لاربع مرات فيما كان في البقية فتقا جراحيا جديدا.

هذا وقد كان حجم الفتق الجراحي يتراوح مابين (12,3)سم طولا و (4,6) سم عرضا . (44) مريض تم اجراء عمليات اضافية لهم متزامنة مع رتق الفتق وهي كالاتي:- ربط انابيب فالوب في (12) مريض,فصل التصاقات الامعاء في(8) منهم,خياطة المعي الدقيق في (4) وتقويم جدارالبطن في (20) مريض.وكانت المضاعفات الرئيسية مابعد العمليات هي :- (17,3%) انصباب مصلي, (10%)انصباب كيلوسي دموي , (9,1%)التهاب الجرح السطحي , (6,4%) التهاب رئوي,مريض واحد فقط عانى من ناسور المعي اقتضى ازالة الشبكة فيما جاء خمسة مرضى بفتق جراحي عائد.معظم المرضى الذين ابانوا المضاعفات هم من مصابي داء داء السكري ,السمنة ومستخدمي العقارات الستيرويدية.علما انه لم تسجل اي حالة وفاة.

الخاتمة :ان عملية الرتق الجراحي بالشبكة هي عملية امنة وبسيطة وعلى الطبيب ان ينصح بتقليل الوزن والسيطرة على داء السكري والامتناع عن التدخين وتجنب عقار الستيرويد للحصول على افضل النتائج الجراحية مع تقنية جراحية دقيقة لتفادي حصول المضاعفات.

Abstract

Background:-Incisional hernia is frequently met by the general surgeon, itis frequently complicated (3.8-11.5%)of patients after abdominal surgery. Repair of large incisional hernia is a difficult surgical problem with recurrence being a common. Numerous methods of repair have been described simple opposition in one layer or complex opposition and the use of prosthetic mesh.

The aim of this study is to report our experience with the use of mesh repair and risk factors that influence post operative complications.

Methods:-A prospective study done in Al-hussain teaching Hospital, Department of Surgery between January 2011 to December 2013.One hundred and ten patients with prosthetic repair of incisional hernia were included in this study.

History was taken and thorough examination was done, all patients were asked for history of diabetes mellitus, obesity, corticosteroid use, their original operations, primary or recurrent hernia and examined for their body mass index, size and duration of the hernial defect were recorded.

A proforma was completed for each patient, noting prophylactic antibiotics had been given or not, type of the sac and whether opened or inverted, type and size of

mesh had been used, intraoperative and postoperative complications and postoperative hospital stay.

Results:-Of (110) patients, (62) were females, (48)were males,their median age was (45.5) years for women and (58) years for men,(31)patients(28.2%)weighted more than their ideal body weight and had body mass index equal or more than(30).Forty eight patients (43.6%) were diabetic and (24)patients(21.8%)were corticosteroid used.

The original operations were bowel related and gynecological in the majority of patients. Previous incisions were long midline in(38) .Twenty patients had one past operation, (13)had two,(5) had three and one patient had four past repair, the remaining were new Incisional hernia patients.

The main hernia size was (12.3) cm and (4.6) cm in vertical and horizontal direction respectively. Forty four patients had additional surgical procedures, consisted of Fallopian tube ligation in (12) ,division of small bowel adhesions in (8) ,suturing of small bowel perforation in (4) and abdominoplasty in (20) patients. In the majority of patients (78), standard polypropylene mesh had been used and vicryl-prolene (Vypro) mesh in the remaining (32) patients.

The main postoperative complications were seroma formation (17.3%), wound haematoma (10%), wound infection (9.1%), chest infection (6.4%), one patient developed intestinal fistula and mesh need to be removed. Five recurrent incisional hernias occurred. Most patients developed complications were obese, diabetic and corticosteroid used.

No death in our series.

Conclusion:-Tension free incisional hernia repair using prosthetic mesh is a safe and easy procedure with no major morbidity or recurrence.

The patient-doctor should advise weight loss to help reduce risks of surgery and improve the surgical results. Control of diabetes, corticosteroid drug use and smoking cessation are recommended for better results. Rigid sterile condition, precise and meticulous technique with the use of closed suction drains is important.

Introduction

Incisional hernia is a bulge or protrusion that occurs near or directly along a prior abdominal surgical incision. It can occur at the site of any type of abdominal surgery previously performed on a wide range of individuals, from the breastbone down to the groin.[1,2,3]It has been reported to complicate (3.8-11.5%) of patients after abdominal surgery.[4,5,6]Although many factors are implicated in the aetiology,infection of abdominal incision remains to be the most important cause for its development[5].Re-incision of healed abdominal laparotomies are considered as another important cause. Majority of the patients affected are obese. Diabetes mellitus and chronic bronchitis associated with smoking are not uncommon, and may predispose to a second recurrence.[4,5]

Ninety percent of incisional hernias occur within three years.[6,7]Repair of large abdominal Incisional hernia is a difficult surgical problem with recurrence being a common. Recurrence rates of up to (33%) after first repair and (44%) after second repair have been reported.[7,8,9]

Numerous methods of repair have been described, simple opposition in one layer or complex opposition such as Mayo, Keel and Da-Silva overlap, use of fascia (local or flaps) with suture darns, and the use of prosthetic repair with synthetic mesh (polypropylene) or Marlex mesh, stainless steel, mersilene or expanded polytetrafluoroethylene.[6-12] The mesh may be placed as an onlay, inlay extraperitoneal) or sublay (intraperitoneal) graft. Each technique has its own advocates.[13]

In a literature review Loh et al(1992)states that overlapping

techniques produce impressive results and the techniques using mesh repair have the advantage of overcoming excessive tension.[14]Although prosthetic repair is a tension free and reduces the incidence of recurrence, despite this significant benefit, it is a foreign material and susceptible to infection, sinus formation, enteric fistulization and possible extrusion. In addition, the repair of incisional hernia should not be classified as a clean surgical procedure. [7]

Aim of the study

Due to these factors and others, we report our experience with use of prosthetic synthetic mesh repair for incisional hernia and we study the risk factors that influence the postoperative complications mentioned above.

Patients and methods

A prospective study done in Al-hussain teaching Hospital, Department of Surgery between January 2011 to December 2013.One hundred and ten patients with prosthetic repair of incisional hernia were included in this study.

History was taken and thorough physical examination was done. All patients were asked for history of diabetes mellitus, corticosteroid use, their original operations, primary or recurrent hernia and examined for body mass index, type of old incision, size and dimensions of the hernial defect were recorded.

Preoperative investigations were done for every patient, blood and urine tests, an electrocardiogram and chest x-ray.

A proforma was completed for each patient noting prophylactic antibiotics had been given or not, type of the sac(unilocular or multilocular),opened or inverted, type and size of mesh had been used,intraoperative and postoperative complications and postoperative hospital stay.

Operative technique

All operations were performed under general anaesthesia., if the hernia is near the stomach, a gastric tube may be inserted to decompress the stomach.

After skin preparation and draping, the cutaneous previous scar was excised and flap of the skin and subcutaneous tissue are dissected as far as the lateral border of the rectus sheath.

Haemostasis meticulously secured and the sac was opened only if there was a definite history of obstruction, if the sac was irreducible or additional operation was indicated, otherwise sac was inverted by approximation of its lateral edges with continuous 0 polydiaxanone suture. After that onlay polypropylene or lightweight composite mesh (Vypro) placed with three centimeters overlap on to normal tissue to which it secured with interrupted monofilament 2/0 nylon sutures.

Two suction drains were inserted, and skin closed with subcuticular or mattress sutures. All patients received 2500-3000 ml intravenous fluid in the first postoperative day and twice daily dose of cefotaxime 1gm intravenously for three to five days postoperatively.Drains removed when there was less than 50ml of drainage in 24hours.

Postoperatively, the patient will be observed for a surgical wound bleeding or swelling, report of fever and any abdominal pain. Patients were mobilized as soon as possible and discharged home once the drains had been removed. Mean hospital stay was five days (range 3-10 days).Patients attended for clinical follow up at 10,21day ,4,12 and 24 months after surgery, at each visit, wound assessment were completed to determine the presence of wound infection ,seroma, haematoma and chronic wound pain, the patient was examined in the erect position with coughing, in the supine position and after tensing the abdominal wall by straight leg rising. Recurrent hernia whether visible as a bulge or

palpable as a defect in the aponeurotic layer was recorded.

Results

Of the(110)patients for whom incisional hernia repaired by the prosthetic reinforcement(62)were females and(48)were males,their median age was 45.5years for women(range 22-64years)and 58years for men(range 18-72years).Thirty one patients(28.2%)weighted more than their ideal body weight and had body mass index"BMI"equal or more than 30.Forty eight patients(43.6%)were diabetic and twenty four patients(21.8%)were corticosteroid used, table(1).

Table(1) Median age and main risk factors of both sexes of patients

Patient sex	Patient No.	Median age and range	BMI ≥ 30	%	Diabetes mellitus	%	Steroid use	%
female	62	45.5yr (22-64)	23	20.9	29	26.3	17	15.4
male	48	58yr (18-72)	8	7.2	19	17.2	7	6.3
Total	110		31	28.2	48	43.6	24	21.8

The original operations were bowel related and gynaecological, table (2)**.**

Table (2). The original operations

operation	Patients no.	%
Gastrointestinal	53	48
Gynaecological	35	31.8
Hepatopancreaticobiliary	12	10.9
Urological	10	9
Total	110	100%

The previous incision was long midline in (38) patients, table (3)

Table (3) The previous incisions

Previous incision	Patients no.	%
Long midline	38	34.5
Lower midline	29	26.3
Upper midline	15	13.6
Right paramedian	13	11.8
Oblique	7	6.3
Transverse	6	5.4
Rooftop	2	1.8
Total	110	100%

Regarding the number of previous repairs, (20) patients had one past repair, (13) patients had two,(5)patients had three and one patients had four past repair, the remaining patients were new incisional hernia patients. The mean hernia size was 12.3 cm in vertical direction and 4.6 cm in horizontal direction.

Prophylactic antibiotics had been used in (69) patients, and ignored in the remaining patients.

Additional surgical procedures consisted of Fallopian tube ligation in(12)patients, division of small bowel adhesions in(8)patients, in(4)patients small bowel perforation occurred and need suturing, in(20)patients abdominoplasty were needed whenever indicated, table(4).

Table (4) Additional surgical procedures

Additional procedures	Patients no.	%
Abdominoplasty	20	18.1
Tubal ligation	12	10.9
Division of small bowel adhesion	8	7.2
Small bowel suturing	4	3.6
Total	44	39.8%

Regarding the type of mesh used, in (78) patients standard polypropylene (prolene) mesh had been used, the remaining (32) patients lightweight composite mesh was constructed from multifilament of polypropylene with additional absorbable polyglactine (Vypro, Ethicon), both types of mesh was placed as onlay mesh.
Considering the size of mesh, table (5)

Table (5) Size of the mesh

Size of the mesh	Patients no.
30 x 30 cm	53
15 x 15 cm	49
15 x 7.5 cm	8

Two suction drains inserted subcutaneously and placed in dependent part. Size of the drain in the majority of patients is 14FG in (76) patients, 12FG in (24) patients and 10FG in (10) patients. The mean time for removal of the drains was three days (range 2-8days).

In(92)patients no subcutaneous suture was placed and skin closed by non absorbable nylon suture(2-3)key sutures obliterating the dead space, involved skin and subcutaneous tissue together by no.1 nylon suture,90 mm,cutting needle and the remaining wound closed by interrupted mattress sutures or sucuticular using no.2/0 nylon,25 mm,cutting needle.
The post operative complications shown in table (6).

Table (6) Postoperative complications

Postoperative complications	Patients no.	%
Seroma formation	19	17.3
Wound haematoma	11	10
Wound infection	10	9.1
Chest infection	7	6.4
Urinary retention	5	4.5
Wound edge necrosis	4	3.6
Intestinal fistula	1	0.9
Recurrent hernia	5	4.5
Total	62	56.3%

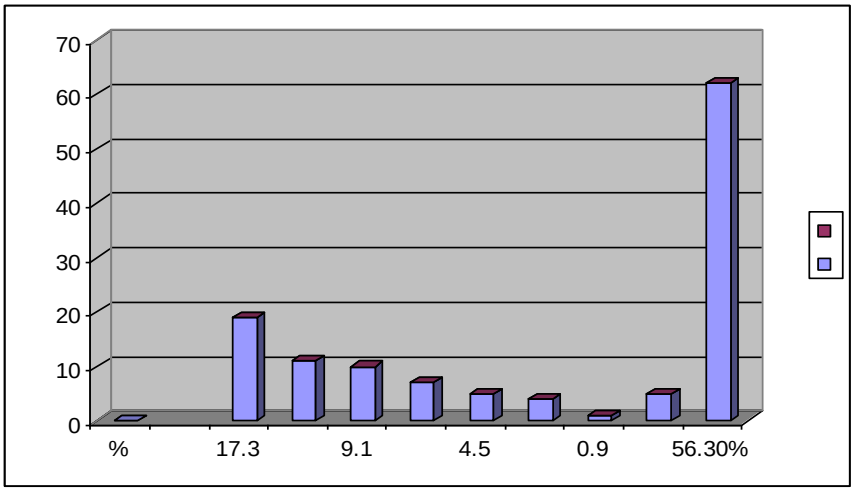
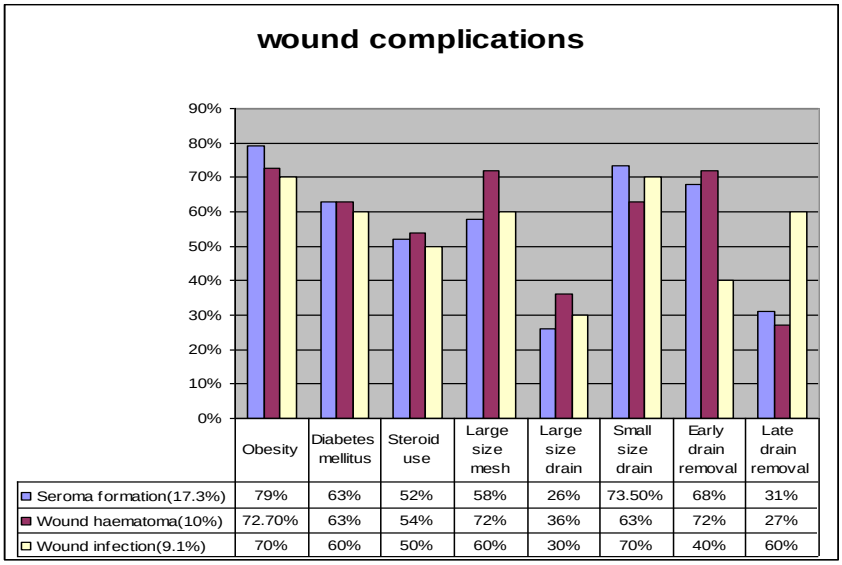


Figure (1) Postoperative complications

The wound complications in patients underwent incisional herniplasty in relation to some risk factors are summarized in the figure (2).



	Obesity	Diabetes mellitus	Steroid use	Large size mesh	Large size drain	Small size drain	Early drain removal	Late drain removal
Seroma formation(17.3%)	79%	63%	52%	58%	26%	73.50%	68%	31%
Wound haematoma(10%)	72.70%	63%	54%	72%	36%	63%	72%	27%
Wound infection(9.1%)	70%	60%	50%	60%	30%	70%	40%	60%

Figure (2) Wound complications in relation to some risk factors after Incisional hernioplasty

Discussion

Repairing an incisional hernia is a major challenge for a surgeon[7, 15]. Repairing of incisional hernia is performed to correct a weakened area that has developed in the scarred muscle tissue around prior abdominal surgical incision.

The high recurrence rates observed during hernia repair by tissue approximation lead to development of tension free procedures by using prosthetic materials. The use of a prosthetic mesh to repair Incisional hernia is well established nowadays. [1, 2]

The most important complication of Incisional hernia repair is another recurrence of the hernia. The incidence of this complication has been shown to halve the rate of recurrence when use of mesh for repair compared with standard suture repair [1, 8, 9]. Predisposing factors implicated in the aetiology of recurrence of the hernia include obesity and infection, but what is important is the technique and type of surgical repair[16]. An important consideration for good surgical repair is a tension free with prosthetic re-enforcement , polypropylene (Prolene) mesh is the most

commonly used prosthetic material , it is a permanent synthetic prosthesis are now widely employed in the management of hernia of abdominal wall .

At first , there was concern that synthetic prosthesis would act like foreign bodies and would easy become infected , this study is design to report of complications following the use of polypropylene mesh have ranged from minor complications such as wound seroma and infection to more serious complications such as intestinal perforation and fistula formation .

The incidence of seroma formation (17.3%) , it was treated relatively easy and sometimes it require frequent aspiration "draining of" at dependant part of the wound .

Wound seroma commonly occur when small size suction catheter was used and when it removed too early.

Wound seroma also increase in obese patient "in our series in patients whom BMI ≥ 30 ".

Wound haematoma developed in 10%, it was common in obese patient, when small size suction catheter was used and when large size mesh was used for re-enforcement.

This complication could be avoided by the surgeon should be ascertain that bleeding point has been stopped before closure of the wound , the surgeon should not relay on drains to remove blood , blood is more likely to clot and form a haematoma than to be removed by a drain .[9]

The wound infection (9.1%) in our series was superficial, above the fascia. The management of infected wounds that contain a synthetic prosthesis is relatively easy and requires simple application of sound surgical principle, Chew et al, reported that if mesh was infected, incorporation rather than rejection usually can be expected; the prosthesis is not floating free in the wound but is in firm contact with healthy tissue[17].

Treatment of wound infection include local treatment, consist of irrigating away purulent material and systemic antibiotics were essential. Wound infection increase in diabetic, obese patient and if suction drain kept for too long (especially longer than 7 days). So closed suction catheter drain are important to evacuate blood and serum and to keep the tissue in opposition, minimizing the risk of seroma formation.

Although there are no objective data on the best time to remove these drains, the incidence of wound seroma increase if they removed too early, and incidence of wound infection increase if they are kept for too long .[18]

Catheter probably should be removed when the drainage is less than 50 ml per 24 hours or seven days after surgery, which ever comes first .[18]

The incidence of tissue necrosis at the wound margins (3.6%), it was seen when the large size mesh had been applied for the re-enforcement, and can be explained by that the wound edge can be become desiccated, and also due to large size of skin and subcutaneous flap, associated with disturbance of its blood supply leading to tissue necrosis at the wound margins, this can be prevented by placing moist laparotomy pads over the edge of the wound and meticulous dissection of flaps.

There are no definitive studies that provide data on whether subcutaneous sutures affect the risk of wound infection, but it seems to place few foreign bodies into the wound.

There are five patients (4.5%) who develop recurrent Incisional hernia, 4 with mesh and one with removed mesh. All patients were diabetic, obese and under corticosteroids therapy.

The size of hernia, size of the mesh and also the type of mesh didn't affect the rate of recurrence.

One case of intestinal fistula we report in this study, the gut was damaged during dissection of the sac rather than by the

mesh itself. Vrijland et al[19] , reported that enterocutaneous fistula formation appear to be very rare after Incisional hernia repair with polypropylene mesh , regardless of intraperitoneal placement , omental coverage or closing of the peritoneum .

Additional operations didn't affect the postoperative complications in prosthetic repair of Incisional hernia.

Conclusion

The tension –free Incisional hernia repair using synthetic mesh is, a safe and easy procedure with no major morbidity or recurrence.

The patient-doctor should advise weight loss to help reduce risks of surgery and improve the surgical results. Control of diabetes, corticosteroid drug use and smoking cessation are recommended for better results. Rigid sterile condition, precise and meticulous technique with the use of closed suction drains is important.

Antibiotics prophylaxis didn't prevent the occurrence of wound infection after abdominal wall hernia repair with polypropylene mesh. There were no sinus formation in our series and no death related to hernia repair.

Urinary retention was occurred in old aged male patient with Benign Prostatic Hyperplasia (BPH) and chest infection in heavy smoker obese patient.

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