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Research Article

Combined Fascial Flap and Mesh Repair for Large Incisional Hernias

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Abstract: Incisional hernia is one of the most common post operative complications of abdominal surgery. Its prevalence varies between 11%- 23%. The recurrence rate of incisional hernia remains high in spite of the many procedures described for its repair and advancement of the measures taken for its prevention. The aim of our study was to evaluate the outcomes of repairing large incisional hernias by a combined fascial flaps reinforced by polypropelene mesh at Ribat university hospital Khartoum, Sudan. A cohort of forty two patients with large incisional hernias, with mean age of 38-year, underwent repair of their incisional hernias by a combined fascial flap and mesh technique, between January 2006 and December 2008. Thirty four (80.9%) were females and 8 males. Thirty one percent (31%) of the hernias were recurrent. The size of the repaired hernias varies between 15 – 25 cm in length and 5 – 10 cm in width. The mean operative time was 2.5 hours and the mean hospital stay 7.9 days. No intra operative complications were recorded and the post operative complications were minor to moderate and controlled by non-surgical measures. The recurrence rate was 2.4% within a mean follow up period of 38 months. In conclusion, the combined fascial flap and mesh technique for repairing large incisional hernias is safe, effective and is followed by a reduced recurrence and complication rates.
Keywords: large incisional hernias, combined repair, fascial flap and mesh, recurrence

INTRODUCTION

Incisional hernia (IH) is one of the most prevalent post operative complications of abdominal surgery. The incidence of IH varies between 11% to 23%, depending on the multiple risk factors that contribute in its development [1]. Incisional hernia should be repaired because if left it will enlarge and makes repair difficult. Burdens that IH can cause include pain, unsightly appearance, limitations of daily activity and the uncommon but serious complications such as intestinal obstruction, incarceration and strangulation and the fatal complication of hernia ulceration and rupture [2, 3]. Large numbers of procedures and techniques were described for the repair of IH (suture repair, prosthetic repair, combined repair, flaps and tissue mobilization and laparoscopic repair). Small IH can be repaired without tension by anatomical suture repair [4, 5] Large IH where there is a substantial defect of the abdominal wall, represent a real challenge for surgeons especially in the presence of risk factors. Repair of such big IH may require mobilization or separation of fascias and tissues, the use of different prosthetic materials or a combination of the two techniques [5-9]. The recurrence rate of IH remains high in spite of the many improvements in the techniques of repair and in the suture material technology and quality [4]. A recurrence rate of 44% - 54% was reported [10, 11].

Tension created by repair of large IH and the attempts of returning the content of the hernia into the contracted peritoneal cavity leads to increased tension and stretch on the abdominal wall which increases the rate of wound failure and IH recurrence. Preventing tension during repair of large IH, by avoiding direct suturing of fascial layer, may reduce the rate of IH recurrence. One of the techniques described for avoiding direct suturing of the abdominal wall layers was by creation of tissue flaps which can bridge the hernia defect without tension. In 1933 Rothschild presented a technique in which he used flaps of the anterior rectus sheath for repairing midline incisional hernias [12]. Browse and Hurst in 1979 used a technique of reflected anterior rectus sheath flaps to bridge the mid line defect and reinforced it by synthetic mesh [13]. In 1998 Whiteley used the technique described by Browse for repairing hernias other than med line IH [14]. Using such a technique can reduce the recurrence rate and helps repairing of large IH without undue tension. The aims of the present study were to evaluate the outcomes of repairing large ventral abdominal incisional hernias using a reflected fascial flaps reinforced by polypropelene mesh.

METHODOLOY

A prospective cohort study design was selected for the present study. From January 2006 through December 2008 a cohort of Forty two (42) patients with large ventral incisional hernias, underwent repair of their hernias by reflected fascial flaps reinforced by polypropelene mesh at Ribat national university hospital Khartoum, Sudan. An informed consent was obtained from all patients before being included in the

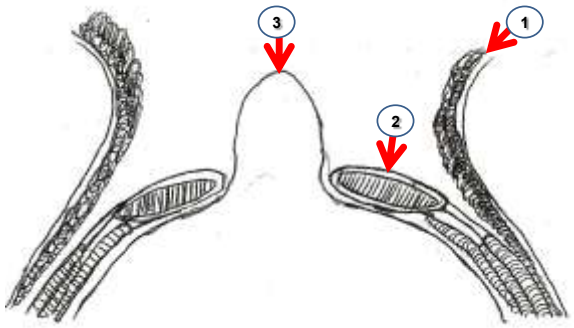
study. Written permissions were obtained from patients to publish the photos in the present study. The present study was approved by the research committee of Alzaeim Alazhari University. All operations were performed by one surgeon (IMM).The data of the present study was collected prospectively in especially designed form. The primary outcome was recurrence rate and the secondary outcomes were post operative wound infection, haematoma and Seroma formation, operative time and hospital stay.

Technique

The approach was through excising the previous scar. The subcutaneous layer is dissected all around the hernia defect to expose approximately 5-8 cm of the fascial layer covering the muscle. The peritoneum is opened only to free the bowel adhesions suggested by history of episodes of adhesive intestinal obstruction. A circumferential incision, 3-5cm from the edges of the hernia defect, is made through the fascial layer down to the muscle. The fascia is then dissected from the muscle to raise the flaps. The free edges of the raised fascial flaps are reflected and sutured together by continuous no 1 polyamide or polypropelene suture material, to cover the hernial defect. The fascial defect resulted from the raised and reflected flaps are then covered by polypropelene mesh fashioned to fit the defect. The mesh is fixed to the outer edges of the incised fascia by continuous technique using no 1 polyamide or polypropelene suture materials. The skin is closed over a suction drain left in the subcutaneous space. Figure 1 illustrates the steps of the procedure.

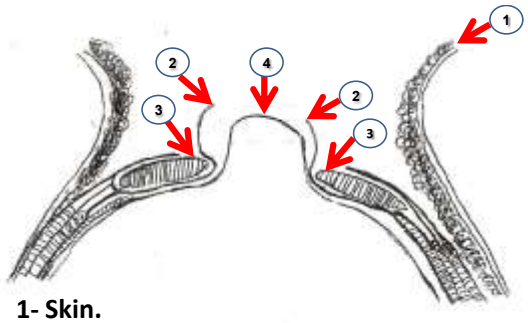
All the procedures were performed under general anaesthsia with endo-tracheal intubation, and under prophylactic antibiotics cover (Ceftrioxone 1gram intra venous (iv) 1-2 doses) the first administered at induction of anaesthsia. Post operative analgesia

(Pethedine 50-100 mg iv or Diclofenac sodium 75 mg intramuscular) was prescribed for all patients as required. A second suction drain was fixed underneath the mesh when there was more than usual ooze of blood after raising the fascial flaps fig 3.



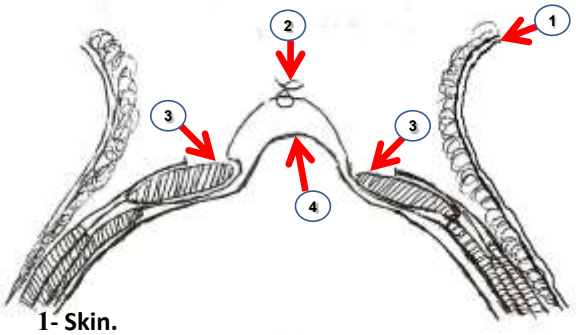
1-Skin & sub cutaneous layer.
2-Hernial sac.
3-Muscle covered by its facia.

Fig. 1A: The hernia defect



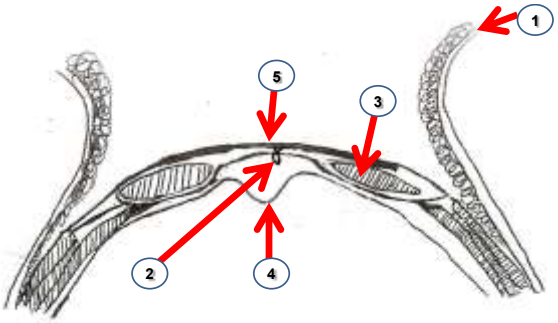
1- Skin.
2- Raised fascial flaps.
3- Muscle.
4- Hernial sac

Fig. 1B: Polypropelene mesh fixed to the free edge of the incised fascia



1- Skin.
2-Fasial flaps sutured .
3- Muscles not coverd.
4- Hernial sac

Fig. 1C: The fascial flaps sutured



1- Skin.
2-Fascial flaps bridging heria defect
3-Muscle.
4- Hernial sac

Fig. 1D: 5-Polypropelene mesh sutured

Fig.1A-D: Illustrates the steps of the technique

Fig. 2: The polypropelene mesh sutured to the free edge of the fascial layer 5-polypropelene mesh fixed (It illustrates the fixation of the polypropelene mesh to the free edges of the incised fascia)

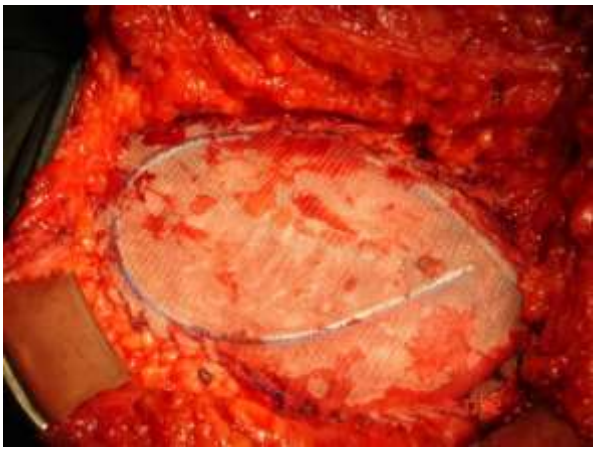


Fig. 3: A second drain fixed underneath the mesh

The drains were removed when the drainage becomes less than 50ml/day. The patients were discharged after resuming oral intake and there were no signs of immediate postoperative complications. At discharge the patients were instructed to come for follow up at 1, 3, 6 months and then annually. At the follow up visits the patient were interrogated about pain or discomfort and examined for signs of recurrence. The patients for whom the follow up visits were difficult (living far away) were followed by phone call enquiring about symptoms(pain or bulge at site of operation) if any they were requested to come for physical examination.

RESULTS

Forty two patients were operated, 34 (80.9%) females and 8(19.1%) males. The mean age of the patient was 45 years (range 35-60). About two third of the repaired hernias were recurrent hernias, and 57% of the primary surgery, that resulted in incisional hernia, were emergency operation, and 69.1% of them were obstetrical/ gynaecological operations. Table 1 shows the nature of the primary surgery of the cohort of patients. Table 2 and 3 show the site and type of the hernias repaired.

Table 1: The nature of the original operations

Operation	No	(%)
Caesarian sections	15	(35.7%)
Repeated Caesarian sections	9	(21.4%)
laparotomy	8	(19.1%)
Gynaecological operations	5	(11.9%)
Open cholecystectomy	4	(9.4%)
Appendicectomy	1	(2.4%)

Table 2: The site of original incisions (site of hernia)

Site of original incision	No	(%)
Lower mid line	29	(69.1%)
Upper midline	6	(14.3%)
Upper right para median	3	(7.1%)
Lower right paramedian	2	(4.7%)
Right sub costal	1	(2.4%)
Right oblique muscle cutting	1	(2.4%)

Table 3: Percentage of primary and recurrent repaired hernias

Hernia recurrence	No	(%)
Primary hernia	29	(69.1%)
First recurrence	7	(16.6%)
Second recurrence	4	(9.5%)
Third recurrence	2	(4.8%)

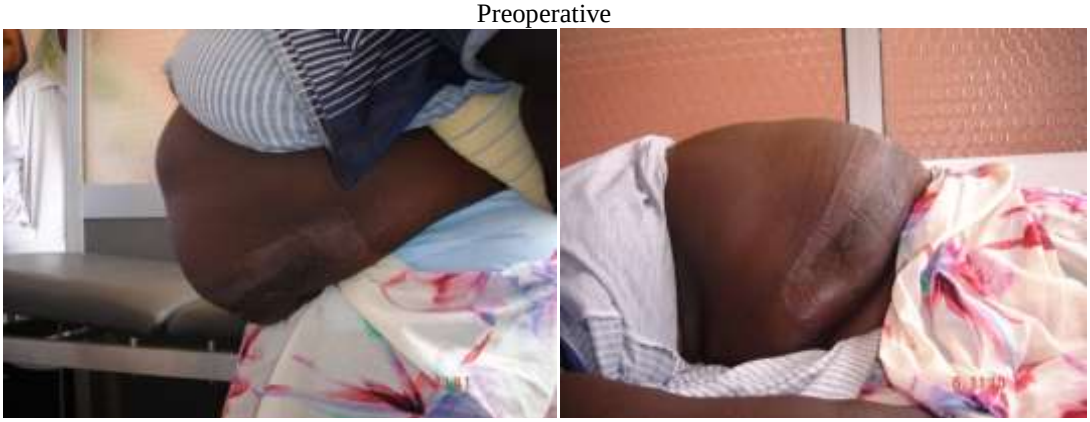
Table 4: Complications developed after combined fascial flaps and mesh repair of large IH

Complication	No	(%)
Mild chest infection	7	(16.6%)
Wound infection	4	(9.5%)
Seroma formation	4	(9.5 %)
Recurrence	1	(2.4%)

Seven of the patients had abdominoplasty performed in addition to the repair of their hernias, and one female patient hat tubal ligation and abdominoplasty plus repair. The size of the hernia defect was between 15-25cm in length and 5-10 cm in width. Operative time (calculated from incising the skin to apply the dressing) range 1.3 - 3hours (mean 2.5hours). Postoperative hospital stays range 3-15 days (mean 7.9 days). No intraoperative complications were recorded. The post operative complications developed were mild to moderate and were controlled by non surgical interventions. Table **4** illustrates the post operative complications.

The mean follow up period was 38 months (range 26 – 58 months). One single recurrence developed in a heavy smoker male patient after 30 months. Figure **5** shows the preoperative and postoperative appearance of one of the patients.

Preoperative



Postoperative

Fig. 4: preoperative and post operative outcome of one of the repaired hernias

DISCUSSION

The technique we used to repair this group of large incisional hernias showed a clinical recurrence rate of 2.4% after a mean follow up of 38 months. The recurrence rate is acceptable bearing in mind the fact that all hernias were large and 30.9% were recurrent. Hossein reported a recurrence rate of 7% using a technique similar to the technique we used reinforced by a third layer of intra abdominal mesh [15]. The advantages of the present technique include: Creation of a layer of natural tissue which is then strengthened by a synthetic layer. The reflected fascial flaps separate the

bowel from the mesh thus preventing adhesions and bowel damage. The muscles underneath the mesh are drown together and so increasing the natural strength of the repair. The technique provide a tension-free two-layer strong repair and it is easy to learn, teach and performme. The present technique can guard against the development of abdominal compartment syndrome that may develop after repairing large long standing incisional hernias, because the reflected fascial flaps can bridge the defect and thus safe the volume of the peritoneal cavity. Although the sublay positioning of prosthetic mesh is considered as advantageous to onlay, but our study showed a low recurrence and complication rates and this is in consistence with what Andersen reported [16, 17]. The low rate of infective complications in our series is because we used prophylactic antibiotic in all patients and the use of prophylactic antibiotic therapy is known to be effective in reducing local wound infection after mesh repair of IH [18].

One of the limitations of our study is the follow up by physical examination only which can miss the diagnosis of a symptomatic recurrence of IH. Some studies showed that ultra sound is useful in detecting incisional hernias that are difficult to be detected by physical examination [19]. The follow up by phone calls again can miss the detection of some of the complications or recurrences.

CONCLUSION

The repair of large incisional hernias, by a combined technique of reflected fascial flaps and polypropelene mesh is feasible, safe and with reduced recurrence and complication rates.

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