
Open Onlay Mesh Repair for Abdominal Incisional Hernia

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Abstract

Background: The incisional hernias still continue to be a serious problem and challenge for surgeons.

Objective: To see the relative effectiveness of open Onlay mesh repair for incisional hernia in terms of clinical outcome, quality of life and rate of recurrence.

Patients and methods: The study conducted at Al- Yermouk Teaching Hospital, Baghdad. Between April 2006 - July 2009 out of fifty four patients operated upon for incisional hernia by open Onlay mesh graft type of repair. There were 19 females and 35 males, with a mean age of 50. The clinical, surgical, and follow-up data were analyzed.

Results: Mean operating time was 130 min, with an average hospital stay of 8 days. There was no mortality. Postoperative complications occurred in 33.25% of the patients. Most common complications were surgical site infection (SSI) 11.11%, recurrence of 9.25% and seroma 7.4%, respiratory complications 5.5%, DVT 1.85% were found after follow-up of 12- 18 months.

Conclusion: The incisional hernia recurrence, morbidity & complications are significantly low in onlay mesh repair.

Key words: Incisional hernia, open onlay repair, complications.

Introduction

Incisional hernia is a common complication after abdominal surgery with a reported incidence of 11–20%⁽¹⁾.

It is one of the most frequent long term complications of abdominal surgeries especially after emergency surgery. Incisional hernias occurring during the early postoperative days are due to technical failures, such as loosening of knots, breaking of sutures, or suture cutting through tissues. Late hernias are more likely to be due to complications of endogenous wound healing and constitution⁽²⁾.

Incisional hernias enlarge over time and can give rise to complications, including pain, discomfort, bowel obstruction, incarceration and strangulation. Incisional hernias also may adversely affect an individual's quality of life⁽³⁾. Wound infection alone after abdominal surgery increases the risk of ventral incisional hernia to 30%⁽⁴⁾.

Other postulated predisposing factors are obesity, diabetes mellitus, steroids, smoking and sub-optimal surgical technique, old age, malnutrition, multiple laparotomies, chronic pulmonary disease, type of incision and closure including material used⁽⁵⁾. Abdominal wall defects typically occur within the first five years after surgery, but they may also develop a long time afterwards⁽⁶⁾.

The regenerative ability of aponeurotic tissue is very limited and therefore, the use of a synthetic prosthetic mesh has been advocated for incisional hernia repair. This has led to a lower recurrence rate⁽⁷⁾.

Several methods have been described for repair of defects in the abdominal wall. Incisional hernias have traditionally been treated with primary closure until the introduction of prosthetic mesh hernia repair⁽⁸⁾.

In general mesh, repair is achieved by placement of the mesh different anatomical positions.

The techniques of placements include onlay, inlay, sublay sandwich, a laparoscopic technique etc., but the best position for inserting the material has not been conclusively established till date as per literature^(9,10).

Hernia repair without prosthetic mesh is associated with unsatisfactory recurrence rates varying between 24% - 54%⁽¹¹⁾, while mesh hernia repair results in recurrence rates of 2% -36%⁽¹²⁾. However, because most studies have only provided short-term follow-up, recurrence rates may even be higher as has been learned from the recent long-term follow-up (10 years) of a randomized trial.

A recurrence rate of more than 50% may be encountered after suture repair⁽¹³⁾. The use of mesh in hernia repair can reduce this recurrence rate to 10%⁽¹⁴⁾.

Patient & methods

This is a case study of fifty four patients operated upon for incisional hernia repair which was conducted at Al-Yermouk teaching hospital between April 2006 - July 2009. There were 35 males and 19 females, with a mean age of 50. Most of the cases forty three patients were presented and operated on electively, 11 patients presented as irreducible obstructed incisional hernia where trial of conservative treatment failed with 3 of them and operated on as emergency intestinal obstruction, while the others treated electively later on. Patients were followed through hospital and private clinic visits. Follow-up data were complete in all patients for 12-18 months. We exclude from this study patients who had undergone a previous repair.

For each patient, information was collected into many categories: personal details (age, sex, body mass index, and number of pregnancies), the operation preceding herniation, and any concomitant disease. Patients were considered unsuitable for surgery and were not operated on if they had a body mass index (BMI) >40, or chronic pulmonary or ischemic heart disease, other than patients with a significant risk of anesthesia. At discharge, patients were advised to avoid carrying heavy weights and advised to wear abdominal belt. Patients were reviewed monthly up to 12-18 months.

Operative technique:

All operations were carried out under general anesthesia. Patients received a single dose of intravenous broad-spectrum antibiotic at induction. The repair of the incisional hernia was done by simple suturing with onlay mesh graft; the type of mesh used was polypropylene.

After skin preparation and draping, the old scar was excised and the hernia sac dissected to expose the circumference of the abdominal wall defect. The sac was often opened during dissection but we intended to open the sac if there was a history of intestinal obstruction and even resect part of the peritoneum, with preservation of enough peritoneum for closure. After replacement of hernial sac contents into the peritoneal cavity, the rectus sheath was clearly exposed around the circumference of the defect. Simple suture repair was done using rectus sheath tension free; a relaxing incision was made in the anterior rectus sheath bilaterally if there was significant tension on sutures.

A sheet of polypropylene mesh is then positioned on the anterior sheath between the deep fascia and anterior rectus sheath. There should be an overlap of 3 to 5 cm on all sides or sutured to the lateral edges of the relaxed anterior rectus sheath when a relaxing incision had been used. Closed suction drainage, One or two were employed in all the cases. Deep fascia was approximated using interrupted stitches of fine absorbable suture. Skin was closed with simple interrupted mattress sutures of nylon 2/0.

Suction drain was removed once the drainage falls to 25 to 30 cc usually 2-3 days post operatively. Standard postoperative care included systemic antibiotic, which continue at least for 5 days post operatively when there was evidence of wound infection, analgesia for pain management, and restriction of heavy lifting for 6 weeks.

Results:

In this study, the median duration of hospital stay was 8 days (range = 5–17). Age & sex distribution are shown in table 1, which shows high male to female ratio 9:5. The age incidence for male was more between 50-59 year, while in female the commonest age was 40-49 year.

Table 1 - age and sex distribution

Age (year)	female	male	total	%
20-29	-	1	1	1.85
30-39	3	8	11	20.3
40-49	10	7	17	31.4
50-59	4	14	18	33.3
>60	2	5	7	12.9
total	19	35	54	100

Relation between type of incision and incisional hernia

The relation between type of incision and incisional hernia is shown in figure 1 which shows greater incidence with vertical incision 43 patients (78.95%), followed by oblique incision six patients (=11.11%) transverse incision four patient= (7.4%). The most common type of vertical incisions is extended mid-line incision (37%), followed by lower mid-line incision (25.95%), and upper mid-line incision (=16.6%) of total vertical incisions. For transverse incisions the most common incision is pfannestiel incision three patients (75%) of total transverse incisions.

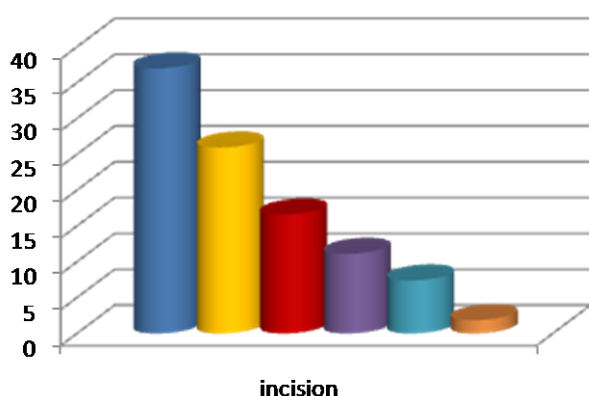


Figure 1- Relation between type of the incisions and incidence of incisional hernias.

■ extended midline
■ lower midline
■ upper midline
■ oblique
■ transverse
■ gridiron

Table 2 -Types of repaired incisions

Incision type	number	%
Upper mid line	9	16.6
Lower mid line	14	25.95
extended mid line	20	37
Transverse	4	7.4
oblique	6	11.11
gridiron	1	1.85
Total	54	100

Table3- mode of admission for treatment of incisional hernia

Mode of admission	Number of patient	%
elective	43	79.63
emergency	11	20.37
total	54	100

Table 3 shows that nearly 80% of the cases treated as an elective case, while 20% of the cases treated urgently.

Mean operating time was 130 min, suction drain was put for all patients, drain was removed after 2-3 days except in 6 patients where prolonged serous discharge was present and drain was kept for 7 days.

Average hospital stay was 8 days. There was no mortality in the study. Postoperative complications occurred in 33.25% of the patients; most of them were minor .A recurrence rate of 9.25% was found after a mean follow-up of 12-18 months.

Table 4 -post operative complications of onlay mesh graft

Post operative complication	number	%
Recurrence	5	9.25
SSI	6	11.11
Seroma	4	7.4
DVT	1	1.85
Respiratory complications	3	5.5

In table 4, there were no postoperative complications in 36 patients (66.66%). The most common local complications were surgical site infection (SSI) and recurrence. The recurrence rate was (9.25%).

Early SSI (within 30 days) was 11.11%, which respond to medical treatment except two cases

(3.7%) developed deep abscesses requiring other surgery and removal of the mesh. Four patient (7.4%) developed seroma which was treated by frequent aspiration, one patient (1.85%) developed deep vein thrombosis treated accordingly, three patients (5.5%) developed respiratory complications. there was no haematoma formation or visceral injury.

Discussion:

In this study there is greater incidence of incisional hernia in male as compared to female 9:5, male; 64.8% versus female; 35.2%, similar results were found in some western studies in which higher male incidence was found 21⁽¹⁵⁾ while other studies showed it was more common in female in Sudanese⁽¹⁶⁾. In female, this is due to effect of increase multiparity among Arabic community as compared to western countries, Multiparity is associated with higher incidence of development of Incisional Hernia.

In our study there is association between increasing age and development of Incisional Hernia, similar results were reported by other studies^(17, 18). This could be explained by a direct correlation between old age and poor wound healing outcomes, non collagenous protein accumulation at wound site decrease with aging⁽¹⁹⁾. In our study Incisional Hernia was more common with vertical incision (78.95%) than transverse incisions (21.3%) or oblique incision (11.11%).

Similar results were reported by other studies^(17, 18). This is probably due to the fact that fascial fibers of anterior abdominal wall lie in transverse direction, therefore dividing it by vertical incision, and during suture closure a tension line lie mediolaterally in vertically placed incisions and cranio-caudal in transverse incisions⁽¹⁷⁾. Most cases were managed surgically as an elective case.

Patients with Incisional hernia are asymptomatic apart from mild discomfort in 43 patients (79.6%).

Recurrent attack of irreducibility, sub acute intestinal obstruction, and even acute intestinal obstruction constitute about one fifth of the patients (20%) were treated as emergency .Any patient who present with any of the above presentation and trial of conservative management succeed with them then we operated upon as an elective cases.

Regarding post operative complications, Infection is of great concern; particularly with the use of mesh even hernia repair without mesh is associated with a high rate of wound infection⁽²⁰⁾.

Our study showed that Post operative SSI following repair of incisional hernia was 11.11%, slightly lower result was reported by Sudanese study 9.6%, but this result is high as compared to western studies which showed incidence of SSI about 5%⁽²¹⁾.

Surgical site infection is a major problem reported to occur in 4–18% of cases after open mesh repair⁽²⁰⁾.

This occur in spite of using prophylactic antibiotic for our patients, so may be due to the lack of optimal condition in our theater like theater and personnel sterilization. Antibiotic prophylaxis is recommended with mesh repair⁽²²⁾, since a mesh infection may result in fulminate sepsis demanding mesh extraction, or fistula formation⁽²³⁾. Similar results were reported by other studies^(17,18).

Our study showed that 7.4% of the patients develop seroma. In western studies various results were reported regarding seroma development according to the type of repair and difference between studies ranging from 0%- 22%⁽²⁴⁾.

Sudanese study showed 14.3% of the patients develop seroma⁽¹⁶⁾. Some other studies showed 20%⁽²⁵⁾; However Pillay et al in his series of 77 patient did not encounter this complication⁽²⁶⁾.

Advantage of this type of repair is that it keeps mesh separated from abdominal contents.

The mean length of operation time with onlay mesh repair exceeded that of the suture repair alone by nearly 30 min. Among the problems attributed to adherence of peritoneal contents to mesh are chronic pain, bowel obstruction and bowel fistulae. Polytetrafluoroethylene (PTFE) does not become incorporated into the surrounding tissues and is not associated with dense adhesions to the intraperitoneal structures⁽¹⁹⁾.

The main disadvantage of the onlay technique is the direct contact of the prosthesis partly or completely with the environment during the wound revision, which can cause wound healing complications. The bacterial contamination of the prosthesis leads to persisting wound infection and the development of long-lasting wound healing complications which often require surgical treatment.

Recurrence rate in our study was 9.25% within period of follow up 12-18 months, three of them developed post operative wound infection and the other two had history of prolonged respiratory complications. A. Israelsson & S. Smedberg⁽²⁷⁾ showed recurrence rate of 19.3%. Luijendijk, RW, Hop, WC, van den Tol in study of 171 patients, the recurrence rate was 23%⁽¹¹⁾. Haroon et al showed the lowest recurrence rate 3.81%⁽²⁸⁾.

Conclusion:

The incisional hernia recurrence morbidity & complications are low in onlay mesh repair

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