

INCISIONAL HERNIA REPAIR WITH POLYPROPYLENE MESH

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ABSTRACT

Objective: To determine the results of incisional hernia repair with polypropylene mesh.

Material and Methods: This prospective cohort study was carried out at Isra University Hospital over a period of 7 years between June 2000 and May 2007. All adult patients presenting with a primary or recurrent incisional hernia were included in this study. Post operative complications and recurrence rates were noted.

Results: Seventy patients underwent incisional hernia repair with onlay mesh re-enforcement preceded by primary repair. Gynaecological / Obstetrical procedures accounted for 77% of all operation resulting in incisional hernia with lower midline incision (64%) being the most common incision. Ten percent of the patients developed seroma formation, 8.5% had skin necrosis of wound margins, 5% had superficial wound infection and 4.2% had haematoma formation. Only one patient developed recurrence during the follow up of one year.

Conclusion: Incisional hernia is more common in lower midline especially after gynaecological / obstetrical and emergency surgery. Primary repair with onlay mesh re-enforcement is safe and easy procedure with acceptable morbidity.

Key words: Incisional hernia, recurrence, mesh repair, onlay technique.

INTRODUCTION

Incisional hernia is a major health care problem. It is one of the most frequent long term complications of abdominal surgeries especially after emergency surgery. Numerous endogenous and exogenous factors are believed to play a role in the genesis of incisional hernia. 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.¹ Most incisional hernias are symptom-free and are discovered only upon routine physical examination. The overall incidence of incisional hernia is 3 – 5 % and is more common in females.^{2,3} The incidence depends on a number of factors including old age, obesity, bowel surgery, suture type, chest infection, abdominal distention, wound infection and immunocompromised patients.⁴ Incisional hernia

repair without prosthesis can result in recurrence rate of 30-50 %. The use of mesh in hernia repair can reduce this recurrence rate to 10 %.⁵⁻⁷ Different techniques are available for the repair of incisional hernias. The surgical treatment of this pathology consists of reconstruction of the abdominal wall without tension and avoiding forced reduction of abdominal diameter, which could lead to respiratory insufficiency.

The objective of this study was to determine the results of incisional hernia repair in Isra University Hospital, Hyderabad.

MATERIAL AND METHODS

This prospective cohort study was carried out at Isra University Hospital over a period of seven years between June 2000 and May 2007. All adult patients presenting with a primary or recurrent incisional hernia were included in this study. Patients with co-morbidities like ascites, intra-abdominal malignancy, cirrhosis and chronic cough

**Incisions resulting in incisional hernias
n=70**

Incisions	Number	%
Lower midline	45	64.2
Upper midline	13	18.5
Pfannensteil	10	14.2
Lumbar (kidney) incision	2	2.8

Table 1

were excluded from the study. Data regarding patient related factor including gender, age, obesity, cough, constipation, symptoms of prostatism, diabetes mellitus, steroid therapy, smoking status and abdominal surgical history were recorded. Operation related factors noted were type of surgery, type of incision, surgical technique of closure, type of suture material used, and postoperative complications like haematoma, dehiscence and wound infection were recorded. All necessary investigations were done preoperatively. Rough assessment of hernia defect was made by clinical examination.

All procedures were performed after administration of broad spectrum antibiotics. Antibiotic therapy was discontinued three to five days after surgery unless there was evidence of wound infection. During operation, the edges of the fascia were approximated in the midline with a continuous polypropylene suture. A poly propylene mesh was tailored according to the defect size so that at least 2 cm of mesh overlapped the fascia and the mesh was sutured to the abdominal wall with a continuous polypropylene suture. Redi-vac suction drain was placed in every case and its out put was monitored on daily basis.

The surgical wound was examined during the postoperative hospital stay, to monitor the progress of healing and to check for evidence of infection, erythema, induration, tenderness, seroma, haematoma, or abscess formation. Drain was removed when they stopped draining serous fluid of less than 20 ml during last 24 hours.

Patients were followed up in surgical clinic at monthly interval for minimum of one year and any post operative complications like wound infection, sinuses, seroma formation or recurrence were noted. Patients were briefed about routine post operative precautions and advised not to lift heavy weights. All this data was recorded on a pre-designed proforma and results were analyzed.

RESULTS

Overall 70 patients underwent incisional hernia repair with mesh during the above mentioned period. The mean age was 45 years with the range of 26 to 55 years. Females (80%) outnumbered males and the highest incidence amongst them was in the 5th decade of life. The main presenting complaint was a swelling and pain in or in the vicinity of the previous operative scar. Gynaecological and obstetrical operations accounted for almost 77% of incisional hernias in female patients presented in this study. The most common incision resulting in an incisional hernia was the lower midline incision (64.2%) followed by upper midline (18.5%) and Pfannensteil incision in 14.2% of cases. Table 1 shows the various incisions responsible for incisional hernias in this study. The only other two females who had incisional hernia other than gynaecological / obstetrical causes had exploratory laparotomy for generalized peritonitis resulting from bowel perforation. Among 14 male patients with incisional hernia, most of them had this after

**Original operations leading to development of
Incisional Hernia n=70**

Procedure	No of patients	%
Obstetric & Gynaecological :		
Caesarean section	41	58.5
Total Abdominal Hysterectomy	13	18.5
General Surgical:		
Laparotomies for bowel perforation	11	15.7
Laparotomies for Gunshot abdomen	02	2.8
Urological Procedures:		
Pyelolithotomy	1	1.4
Pyonephrosis	1	1.4
Transvesical Prostatectomy	1	1.4

Table 2

Post operative complications n=70

Complication	Number of patients (%)
Seroma formation	7 (10%)
Wound haematoma	3 (4.2%)
Superficial wound infection	5 (7.1%)
Skin necrosis	6 (8.5%)
Recurrence	1 (1.4%)

Table 3

emergency surgery for some or other reasons. Nine out of these 14 male patients had peritonitis secondary to bowel perforation, two had gunshot wounds, and one each following pyelolithotomy, drainage of pyonephrosis and transvesical prostatectomy. Table 2 shows the original operations leading to development of incisional hernia.

Seroma formation was the commonest postoperative complication and was seen in 7 (10%) patients. Wound haematoma developed in three (4.2%) patients but it resolved spontaneously in all three patients. Superficial wound infection was seen in 5 (7%) patients during the first week of repair. All of these patients responded well to conservative treatment of repeated dressings and antibiotic therapy. In this study no patient had severe wound infection requiring mesh removal. There was one recurrence seen during the follow up period. Skin necrosis of wound margins was seen in six (8.5%) patients. Simple wound debridement along with antibiotics and dressings were done in these patient. No re-suturing was required in any of these six patients. A detailed account of these complications is shown in table 3.

DISCUSSION

Incisional hernias are a common problem in general surgery and they develop in 2-11% of patients undergoing laparotomy.⁸⁻¹⁰ Incisional hernia starts as symptomless partial disruption of the deeper layers of wounds during the early or immediate postoperative period. The event passes unnoticed usually if the skin wound remain intact once skin sutures are removed. In 80 – 95% of patients, incisional hernia develops within six months to 3 years after initial surgery.¹¹ Those hernias that develop within three years of the operation are more likely to be trouble some and larger in size than those that develop late. Mean age (45years) in our study was lower than other studies.¹² Female preponderance in this study (female to male ratio 4:1) was noticed possibly because of gynaecological and obstetrical procedures (77%). This is difficult to explain. It would be unfair to suggest that gynaecological /

obstetrical nature of operation predisposes to incisional hernia. Many factors need to be considered such as wound factors, patient factors, tissue factors, skill of operating surgeon, type of closure and choice of suture material. Sepsis is the main cause of incisional hernia in most of the cases. Biological nature and abnormal collagen metabolism have been ascribed an important role in the genesis of incisional hernia and high recurrence rate, after surgical hernia repair. In this study, lower midline incisions were found more susceptible to develop incisional hernia as compared to upper midline incisions as seen in other studies.¹⁴⁻¹⁶

No repair, approach or material has become the gold standard in regards to this common difficult problem encountered by surgeons. Incisional hernia repair vary from primary closure only, primary closure with relaxing incisions, primary closure with an onlay mesh reinforcement, onlay mesh placement only, inlay mesh placement, rectorectus mesh placement and intra-peritoneal mesh placement. Combination of the above repairs include a sandwich technique in which mesh is placed as both an onlay and either retrorectus or intraperitoneal and a cuff technique in which mesh is placed around the muscle on each side of the defect and then reinforced edges are primarily closed.⁸ In this study primary closure with an onlay mesh reinforcement technique was used in all patients. This technique was refined and popularized by Chevrel. This technique is versatile and lends itself to repair of structures other than defect in the midline of the abdominal wall.¹⁷

In this study seroma formation was the most common complication seen in about 10% of the patients. This is consistent with some other local studies showing about 3.7%, 5% and 20% respectively.¹⁸⁻²⁰ In some international studies the percentages of seroma formation is seen as high as up to 25%.^{9,21,22} However Pillay et al in his series of 77 patients did not encounter this complication.¹¹

Wound infection is potentially a major complication which fortunately is usually superficial but can be severe enough to necessitate removal of mesh.¹⁷ In this study, 7% of the patients showed superficial wound infection during the first week of surgery. All these patients responded to the conservative treatment of antibiotics and daily dressings of the wound. Different studies have quoted different rate of wound infection. Pillay et al¹¹ reported 10% of superficial wound infection while Zarin et al¹⁶ reported 14%. In two other local studies the wound infection rate was noted to be 5% and 10%.^{19,20}

In this study six (8.5%) patients developed skin necrosis of margins of the wounds. Simple wound debridement along with antibiotics and dressings were done in these patient. No re-suturing was required in any of these 6 patients. This is similar to various other studies showing skin necrosis of the wound margins at rates between 1 – 9.9%.^{1,20} Skin haematoma formation was seen in 3 (4.2%) patients. In all these three patients haematoma resolve spontaneously.

Incisional hernia repair is associated with cumulative rates of re-operative repairs¹¹ and recurrence rate after repair has been reported at 10 – 50%.^{10,23,24} Interestingly with advent of prosthetic meshes being used for incisional hernia repair, the recurrence rate has dropped to about 5%.^{25,26} In this study only one (1.4%) patient had recurrence and similar rate is observed in various local studies.^{16,18-}

²⁰ Few recent international studies has shown no recurrence rate^{21,22} while other as high as 15% at 5 year follow up after hernia repair with primary closure and onlay mesh reinforcement technique.¹⁷

CONCLUSION

Incisional hernia is more common in lower midline especially after gynaecological / obstetrical and emergency surgery. Primary repair with onlay mesh re-enforcement is a safe and easy procedure with acceptable morbidity.

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