



Incisional Hernia - A Clinical Case Study and Surgical Management

KEYWORDS

Incisional hernia, surgical site infection, intra-abdominal pressure, mesh, anatomic repair.

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ABSTRACT *Incisional hernia is a common surgical problem, an uncommon sequel of surgical intervention. It occurs as a result of excessive tension and inadequate healing of previous incision, which is often associated with surgical site infection. We have studied here the etiology and risk factor for the development of incisional hernia. Various clinical presentations, incidence of incisional hernia and different therapeutic modalities of treatment and the post operative complication are also carefully examined. In the present series of 50 patients, incisional hernia is seen in between 40-49 years of age, with a male to female ratio of 1:3. Most of them show swelling and pain. Risk factor associated with incisional hernia is anemia, increase in intra-abdominal pressure and wound infection. It is observed that the patients undergone lower segment cesarean section, bilateral tubal ligation, laparotomies, have higher incidence of incisional hernia. Result shows good response with mesh repair compare to anatomic repair.*

INTRODUCTION

Incisional hernia as a diffuse extrusion of peritoneum and abdominal contents through a weak scar of an operation or accidental wound (Tulaskar *et al.*, 2013).

Incisional hernia is a common surgical problem, a common sequel of surgical interventions. It is the result of a failure of fascial tissues to heal and close following laparotomy. Incisional hernia occurs in 2-11% of patients subjected to abdominal operations (Javid *et al.*, 2013; Bucknall *et al.*, 1982). Many factors are associated with incisional hernia like age, sex, obesity, chest infections, type of suture material used and most important wound infections. Several studies have shown that Incisional hernias have different etiologies, which are related to the patient (Alexander and Prudden, 1966), the surgical technique (Richards *et al.*, 1983), the suture material (Carlson and Condon, 1995) and the experience of the surgeon (Copeland *et al.*, 1995).

The average intra-abdominal pressure measures about 8 cm of water both in the upper and lower abdomen in supine posture. Breathing causes a fluctuation of 2-4 cm of water. In the erect posture the upper abdominal pressure remains 8 cm of water while the lower abdominal pressure increases to 20 cm of water. Coughing, vomiting and straining at stools elevate the intra abdominal pressure to over 80 cm of water (Larson and Vandertoll, 1984; King-north, 2006).

The etiological factors are usually acquired. The hernia may result from any condition which tends either to weaken the abdominal parietes or to increase the intra-abdominal pressure. The seeds of incisional hernia are sown at the time of the operation or during convalescence. The predisposing factors for Incisional hernia are related to the patient, the surgical technique, the suture material, post-operative complications and a few relate to surgeon's decision making and custom of approach to specific disease processes (Millikan, 2003).

Several studies have found age greater than 65 to 70 predisposes a patient to wound dehiscence (Bucknall *et al.*,

1982; Blomstedt and Welin-Berger, 1972; Greenall *et al.*, 1980; Pollock *et al.*, 1979). Anemia, vitamin C deficiency and emergency operation were also found to be significant variables in a study (Makela *et al.*, 1995). Wound infection is commonly cited as the most significant independent prognostic factor for incisional hernia (Richards *et al.*, 1983; Blomstedt and Welin-Berger, 1972; Greenall *et al.*, 1980; Pollock *et al.*, 1979; Irvin *et al.*, 1987). Post-operative wound infection was associated with a fivefold increase in the risk of development of a hernia compared with patients with uninfected wounds. Increase in the intra-abdominal pressure in post-operative period, as a result of post-operative abdominal distension due to full bladder, uncontrollable cough, retching and vomiting, straining at stool and urination and intestinal ileus weakens the wound. All of these factors were significantly related to wound dehiscence (Makela *et al.*, 1995). No abdominal incision is immune to the development of incisional hernia and it has occurred in almost every type of abdominal incisions. However, many studies suggest that transverse incisions have a lower rate of incisional hernia than midline incisions (Blomstedt and Welin-Berger, 1972; Greenall *et al.*, 1980; Carlson *et al.*, 1995).

The first symptom of an incisional hernia is usually an asymptomatic bulge noticed by the patient. The bulge can be noticed directly over the scar or in an adjacent area locally related to Symptoms of incisional hernia include a feeling of heaviness, pain or discomfort in the abdomen, as well as constipation or may present as a cosmetic concern. Symptoms will usually be aggravated by coughing or straining as the hernia contents protrude through the abdominal wall defect.

During the pre-antibiotic era, the recurrence rate was quite high and cure rate was low. After the advent of good and safe anesthesia, antibiotics, closed suction drainage, use of prosthetic mesh, transfusion facilities, better understanding of fluid therapy and proper care during preoperative and post-operative period, the cure rate is almost cent percent.

A wide spectrum of surgical techniques have been devel-

oped and recommended, ranging from sutured techniques to the use of various types of prosthetic mesh. Primary surgical repair (approximation of the edges of fascial defect by sutures without mesh) has been widely used (Larson and Vandertoll, 1984). With antibiotic prophylaxis and the development of new synthetic materials, the placement of prosthetic mesh for the repair of Incisional hernia has gained popularity.

MATERIALS AND METHODS

In this dissertation, attempt conducted a clinical study of 50 cases, selected at random and admitted to M.K.C.G. Medical College & Hospital, Berhampur from December 2012 to November 2014. Particular attention has been paid to study the clinical presentation of Incisional hernia i.e. distribution with respect to age and sex, mode of presentation and risk factors associated and the outcomes of surgical techniques of repair for Incisional hernia. All patients underwent surgical treatment. Choice of surgery determined by the extent of disease and associated pathology.

STATISTICS AND RESULTS:

The incidence of different types of hernia seen in this present study is tabulated in Table 1. In the present series, incisional hernia stands second common next to inguinal hernia and contributes to an incidence of 11.55%, in contrast to the literature which suggested that the incidence is probably between 2% and 11% (Carlson and Condon, 1995).

Table 1. Incidence of incisional hernia.

Type of hernia	No. of Cases	Percentage
Inguinal hernia	325	75.06
Incisional hernia	50	11.55
Epigastric hernia	11	2.54
Umbilical hernia	30	6.93
Femoral hernia	1	0.23
Others	16	3.69
Total	433	100

In the present study, incisional hernia is more common in fourth and fifth decade. This may be because of the frequency with which certain operations are performed at this time of life. Carlson and Condon (1995) found that many patients with incisional hernia were between 25 and 90 years with mean age of 60.3 yrs. Incisional hernia occurred at an early age in this study as compared to westerners (see Table 2), probably because of early marriage and multiple pregnancies in Indian women, which leave the abdominal wall weak.

Table 2. Distribution of age.

Age	No. of Cases	Percentage
20-29 Years	9	18%
30-39 Years	10	20%
40-49 Years	17	34%
50-59 Years	10	20%
60 & above Years	04	8%
Total	50	100%

In this study, 72% were females with the sex ratio of males

to females being 1:3 (see Table 3). The preponderance of females merely indicates the greatest proportion of women in undergoing surgery at M.K.C.G. Medical College & Hospital, Berhampur. Regnad et al. (1988) in their study on incisional hernia found that the sex ratio was 1:5. The female preponderance in the occurrence of incisional hernia is probably due to laxity of abdominal wall due to repeated pregnancy and associated obesity which usually is associated with a higher incidence of post-operative infection.

Table 3. Distribution of sex.

Sex	No. of Cases	Percentage
Male	14	28%
Female	36	72%
Total	50	100%

An observation regarding their occupation reveals that the majority of female patients were housewives followed by manual worker (see Table 4).

Table 4. Distribution of occupation.

Occupation	No. of Cases	Percentage
Housewife	32	64%
Manual worker (Female)	3	6%
Manual worker (Male)	15	30%
Total	50	100%

The main complaints in the studied set included swelling, pain and vomiting in combinations. History of swelling was present in all 50 cases; pain was noted in 33 patients and vomiting in 19 patients (see Table 5).

Table 5. Different symptoms at presentation.

Complaints	No. of Cases	Percentage
Swelling	50	100%
Pain	33	66%
Vomiting	19	38%
Constipation	15	30%

Duration of swelling in this study was found that 54% of patients complained about swelling for less than one year whereas about 46% of same reported about feeling swelling for 1-2 years (see Table 6)

Table 6. Duration of swelling.

Duration in Years	No. of Cases	Percentage
Up to 1 Years	27	54%
1-2 Years	23	46%
Total	50	100

Out of 33 female cases, 11 (33.34%) patients were para 3 or more. Rest of the female patients were either para 2 i.e. 16 (48.48%) cases or para 1 i.e. 6 (18.18%) cases (see Table 7).

Table 7. Obstetric history of female patients.

Parity	No. of Cases	Percentage
Para 1	6	18.18
Para 2	16	48.48
Para 3	11	33.34
Total	33	100.00

Out of 50 cases 45 were anemic, 23 of whom were mild anemic, 22 were moderately anemic and required blood transfusions prior to surgery. 24 patients (48%) had complaints of cough or COPD (Bronchial Asthma, TB). 15 cases (30%) were suffering either dribbling of urine with straining or straining during defecation (see Table 8).

These factors may have weakened abdominal wall and predisposed to raised intra-abdominal pressure resulting in herniation of contents.

Table 8. Associated risk factors.

Risk factors	No. of Cases	Percentage
Anemia	45	90.0
Cough/COPD	24	48.0
Straining Micturition/ Stools	15	30.0
Anemia		Hg%
Mild anemia	23	10.0-11.9 g/dL
Moderate anemia	22	7.0-9.9 g/dL
Severe anemia	0	<7.0 g/dL

Nature of preceding operation

Out of the studied 50 cases, 14 patients (28%) had undergone lower segment caesarean section (LSCS), 9 patients (18%) hysterectomy, 9 patients (18%) Tubectomy, 10 patients (20%) laparotomies and 8 patient (16%) underwent appendectomy (see Table 9).

Table 9. Nature of surgery.

Nature of Surgery	No. of Cases	Percentage
Emergency	21	42%
Elective	29	58%
Total	50	100%
Incision		
Lower midline	32	64%
Upper midline	10	20%
McBurney	8	16%
Toatl	50	100%
Procedure		
Appedectomy	8	16%
Hysterectomy	9	18%
LSCS	14	28%
Tubectomy	9	18%
Laprotomy	10	20%
Total	50	100%

29 cases (58%) were elective and the rest 21 were done as an emergency procedure (42%). 64% of the incisional hernias followed operations on the female pelvic organs. The occurrence of hernia after elective surgery was 58% compared to 42% after emergency operations. This should be interpreted with caution because the great majority of operations are elective in nature.

Out of 50 cases, 27 cases were without any associated diseases or conditions and 23 (46%) had one or more condition (see Table 10). There were 16 cases of lung disease, 6 cases of hypertension, 11 cases of Diabetes. None of the patients had other risk factor like malnutrition, generalized wasting, avitaminosis, malignant disease, patients on steroid therapy.

Table 10. Associated disease in incisional hernia.

Associated diseases	Number of patients (n=60)
Absent	27
Lung Disease	16
Hypertension	6
Diabetics	11

There were 12 cases of wound infection following the operation that gave rise to the current incisional hernia. It can be said that longer incisions tend to be associated with infection. Infection can therefore be regarded as the most important risk factor for incisional hernia in this series. Complications like respiratory tract disease following the primary surgery leads to the present incisional hernia due to wound gaping (see Table 11).

Wound infection was noted in 12 cases postoperatively following the surgery is the significant independent prognostic factor that lead to incisional hernia.

Table 11. Postoperative complication of surgery.

Complications	Elective (n=29)	Percentage	Emergency (n=10)	Percentage
Wound Infection	5	17.2	7	33.3
RTI	14	48.2	9	42.9
Seroma	11	37.9	6	28.6
WI + RTI	4	13.7	4	9.0

Out of 50 cases studied, mesh repair (MR) was done in 26 cases (52%) and anatomical repair (AR) was done in the remaining 24 cases (48%) (see Table 12). In 26 mesh repair cases, only mesh was put. The mesh used was polypropylene mesh.

Table 12. Type of hernia repair.

Types	AR	MR	Total
Elective	14	18	32 (64%)
Emergency	10	8	18 (36%)
Total	24 (48%)	26 (52%)	50 (100%)

The maximum number of day of hospital stay is due to postoperative wound infection, seroma formation and respiratory infection along or in combination with each other (see Table 13).

Table 13. Distribution of hospital stay.

Hospital Stay in days	No. of cases	Percentage
1-7 days	6	12%
7-14 days	25	50%
14-21 days	19	38%
>21 days	0	0%

DISCUSSION:

The incidence of incisional hernia was 11.55% and common in fourth and fifth decades it is more common in females with the male to female ratio of 1:3. Abdominal swelling was the commonest presenting complaints. Abdominal pain and vomiting were other complaints. Incisional hernia in females was more common in multiparous women. Anemia, respiratory tract infection (RTI), diabetes and hypertension were associated diseases with incisional hernia. 58% of the incisional hernias developed following elective surgery. 64% of the incisional hernias followed operations on the female pelvic organs. 54% of incisional hernias appeared within 1 year of previous surgery and 46% occurred 1-2 years after primary operation. Infection in postoperative period did seem to be the commonest predisposing factor (24%) for weakening of the scar. Diagnosis of incisional hernia was possible in all cases by clinical examination alone without resorting to any special investigation. Incisional hernias were treated by mesh repair method. Recent trend is to use the prosthetic mesh judiciously. Mesh repair was found to be significantly better for larger defects and multiple defects

Seroma 16.7%, wound infection and respiratory tract infections were the commonest complication (13%) encountered following incisional hernia repair. Post operative complications were minimized by the use of closed suction drains.

There was no mortality in our study. None of the cases showed recurrence. There was no recurrence in our study though the period of follow-up was not adequate to make correct assessment of recurrence. In a short follow-up, it is difficult to comment on recurrence. However, the short-term results indicate a significant improvement in the repair of incisional hernia by the use of a prosthetic mesh

compared with conventional repairs.

Proper preoperative preparation of the patients with high risk is an important factor in preventing recurrence of incisional hernia

Care is therefore required in optimally timing the surgery, minimizing the predisposing factors and also in choice of surgery for repair.

The use of midline incision should be restricted to operations in which unlimited access to the abdominal cavity is necessary.

Meticulous aseptic technique and careful closure of the abdominal wound is necessary to prevent incisional hernia.

The choice of operative technique is critical. For the repair of many years, incisional hernia was associated with a high recurrence rate and the use of synthetic prosthetic materials has provided the opportunity to perform a tension free repair thereby reducing the rate of recurrence in case of large defects.

CONCLUSION

Incisional hernia is more seen in female, housewife who are multiparous. It is mostly presents with swelling and pain abdomen. Previous elective and emergency surgeries in lower midline have higher percentage of incisional hernia. Postoperative wound infection, seroma formation, associated anemia and respiratory tract infection are the risk factor for incisional hernia. Proper preoperative preparation, choice of surgery for repair, aseptic technique, careful closure of abdominal wound decreases the incidence of incisional hernia. The use of synthetic prosthetic material provides the tension free repair & reduces the rate of recurrence.

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REFERENCE

- Alexander, H.C. and Prudden, J.F. 1966. The causes of abdominal wound disruption. *Surg Gynecol Obstet.* 122:1223-1229. | Blomstedt, B. and Welin-Berger, T. 1972. Incisional hernia: A comparison between midline, oblique and transverse incisions. *Acta Chir Scand.* 138:275-278. | Bucknall, T.E., Cox, P.J. and Ellis, H. 1982. Burst abdomen and Incisional hernia: A prospective study of 1129 major laparotomies. *BMJ.* 284:931-933. | Carlson, M.A. and Condon, R.E. 1995. Polyglyconate (maxon) versus nylon suture in midline abdominal incision closure: A prospective randomized trial. *Ann Surg.* 61:980-983. | Carlson, M.A., Ludwig, K.A. and Condon R.E. 1995. Ventral hernia and other complications of 1000 midline incisions. *South Med J.* 88:450-453. | Copeland, G.P., Sagar, P., Brennan, J., Roberts, G., Cornford, P., Millar, A. and Harris C. 1995. Risk-adjusted analysis of surgeon performance: A 1 year study. *Br J Surg.* 82:408-411. | Fagniez, P.L., Hay, J.M. and Lacaine, F. 1985. Abdominal midline incision closure: a multicenter randomized prospective trial of 3135 patients comparing continuous vs. interrupted polyglycolic acid sutures. *Arch Surg.* 120:1351-1355. | Greenall, M.J., Evans, M.J. and Pollock, A.V. 1980. Midline or transverse laparotomy? A random controlled clinical trial. Part I: influence on healing. *Br J Surg.* 67:188-190. | Irvin, T.T., Stoddered, C.J. and Greaney, M.G. 1987. Abdominal wound. *Wissing J, Van Vroonhoven TJMV, Schattenkerk ME.* Fascia closure after midline laparotomy: results of a randomized trial. *Br J Surg.* 74:738-741. | Javid, P.J., Greenberg, J.A. and Brooks, D.C. 2013. Hernias in: *Maingot's Abdominal Operations*, 12th ed, Zinner, M.J. and Ashley, S.W. (Eds) China, McGraw Hill, pp.150-151. | Kingsnorth, A. 2006. The management of incisional hernia. *Ann R Coll Engl.* 88:252-260. | Larson, G.M. and Vandertoll, D.J. 1984. Approaches to repair of ventral hernia and full thickness losses of the abdominal wall. *Surg Clin North Am.* 64:335-349. | Makela, J.T., Kiviniemi, H., Juvonen, T. and Laitinen, S. 1995. Factors influencing wound dehiscence after midline laparotomy. *Am J Surg.* 170:387-390. | Malangoni, M.A. and Rosen, M.J. 2012. Hernias in: *Sabistone Text Book of Surgery - A Biological basis of Modern Surgical Practice*, 19th Edn, Townsend, C.M., Beachamp, R.D., Evers, B.M. and Mattox, K.L. Philadelphia, Elsevier, pp: 1129-1130. | Millikan, K.W. 2003. Incisional hernia repair. *Surg Clin North Am.* 83:1223-1234. | Pollock, A.V., Greenall, M.J. and Evans, M. 1979. Single layer mass closure of major laparotomies by continuous suturing. *J R Soc Med.* 72:889-893. | Regnad, J.F., Hay, J.M. and Rea, S. 1988. Ventral incisional hernias: incidence, date of recurrence, localizations and risk factors. *Ital J Surg Sci.* 3:259-265. | Richards, P.C., Balch, C.M. and Aldrete, J.S. 1983. Abdominal wound closure A randomized prospective study of 571 patients comparing continuous vs interrupted suture technique. *Ann Surg.* 197:238-243. | Tulaskar, N., Nichkaode, P., Dasgupta, S., Gurjar, G. and Umalkar, R. 2013. Clincial study and management of incisional hernia by onlay or preperitoneal mesh repair : A prospective study in rural et up. *IJBAR*, 4:328-334. |