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Original Research Article

Prospective and retrospective study of incisional hernias in a tertiary care hospital

Harikrishnan C. P., Happy Johny Vakayil*

Department of General Surgery, Jubilee Mission Medical College and Research Institute, Thrissur, Kerala, India

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***Correspondence:**
Dr. Happy Johny Vakayil,
E-mail: happy2001johny@gmail.com

ABSTRACT

Background: Incisional hernias are the most common complications of laparotomy. The aim of the present study was to assess and analyse the risk factors leading to development of incisional hernia, different modalities of treatment adopted, postoperative complications and surgical outcome in these patients on follow up.
Methods: This was a combined prospective and retrospective study conducted on 100 cases of incisional hernia admitted to the Department of Surgery, Jubilee Mission Medical College Thrissur, Kerala during the period 2013 - 2015. The technique of the repair was decided by the size of the hernial defect, abdominal muscle tone and general condition of the patient. Postoperatively patients were followed up for detection of possible complications and their treatment.
Results: Majority of the patients were in the age group of 41-50 years. Female preponderance was observed. Postpartum sterilisation in about 30 cases tops the list of prior operation predisposing to incisional hernia. Pain and swelling was the most common complaint noted in 70 cases. The major risk factor noted was cough in about 60% cases. Elective surgeries were done in 85cases and emergency surgeries in 15 cases. Nausea was the immediate complication observed in about 25 cases. Pain and induration was the major late complication observed in 60 cases.
Conclusions: Incisional hernias are more common among females. Cough following previous surgery was the most important risk factor followed by wound infection. Among the repair techniques, complications were lesser and recurrence least for those repaired by mesh, darning and transverse double breasting (Mayo's).

Keywords: Anatomical repair, Incisional hernia, Postoperative complications

INTRODUCTION

Incisional hernia or the postoperative ventral abdominal hernia is a truly iatrogenic condition and its incidence has increased with each increment of abdominal surgical intervention. It is the result of failure of the lines of closure of abdominal wall following laparotomy and is most perfect example of a surgeon dependent variable. The approximated tissues separate and abdominal organs mainly bowel bulge through the gap; which is covered from inside towards with peritoneum, scar tissue and skin.[1] Incisional hernias are serious surgical problems as they have an inordinate tendency to enlarge, are frequently formidable to repair and are usually accompanied by serious associated conditions.[2] It is a very common problem in the present day routine of a general surgeon and is associated with significant morbidity and mortality.[3]

The rate of occurrence of incisional hernias was almost 10-20% after laparotomies.[4,5] The incidence rate rises to 26% in those who develop wound infection.[6] Various risk

factors have been identified to be responsible for the incidence of incisional hernia, including obesity and wound infection; other related factors comprise initial closure of fascia with catgut, drainage tube through the index incision, early wound dehiscence, anemia, immunosuppressant therapy, malnutrition, diabetes mellitus, jaundice and azotaemia.[7,8] Technique and suture length have also been concerned.[9] Incidence of incisional hernia has also been attributed to the disruption of collagen metabolism at the microscopic level. Hence, tension free repairs are recommended.[10]

Our present study was aimed to identify the risk factors associated with incisional hernia as well as factors affecting recurrence and to study the management and postoperative complications of incisional hernia.

METHODS

It is a combined prospective and retrospective study conducted on 100 cases of incisional hernia admitted to the Department of Surgery, Jubilee Mission Medical College and Research Institute, Thrissur, Kerala during the period 2013 - 2015.

With each case study, a careful history is taken; special importance is given in the history to the operation or operations on abdomen and the time interval between the operation and the occurrence of the incisional hernia. Information on the previous operation includes the preoperative nutritional status and whether the operation was conducted on an elective or emergency basis. History of postoperative complications like wound infection, wound dehiscence, burst abdomen, presence or absence of drainage tubes, time of suture removal were asked for, as each one of these is contributory to occurrence of incisional hernia. A note regarding the site and character of scars of previous operation was also made.

Clinical examination was then conducted. Concomitant diseases like diabetes, hypertension, pulmonary tuberculosis were especially noted.

Relevant investigations were carried out. This included pulmonary function tests for cases with lung infections. Besides the routine blood and urine examination, chest X-ray and ECG were taken in all patients above the age of 40 years. Other investigations like estimation of blood sugar, serum electrolytes, serum cholesterol were done only in relevant cases.

During the operation, whether the remnant of any suture material used for the previous operation could be removed or not, was also noted. Other aspects noted were the amount of adhesions between various layers of the abdominal wall and the hernial sac, the site and measurement of the defect and contents of the sac.

The surgical procedure by which the defect is repaired was also noted. The patient was observed during the postoperative period and was watched for the development of any postoperative complications. Follow up was advised after 1 month, 3 months and 6 months.

RESULTS

In the present study, a total of 100 patients with complaints of incisional hernia are included in the study. Table 1 presents the patients clinical and demographic characteristics. Among them females (86) are higher in number compared to males (14). Most of the cases (47) belong to the age group of 41-50 years. Maximum number (45) of the patients weighs under 51-60 kgs. Postpartum sterilization in about 30 cases tops the list of prior operation predisposing to incisional hernia followed by abdominal hysterectomy in 24 cases and lower segment caesarian section in 20 cases. The time interval between the previous operation and the beginning of the abdominal symptoms ranged between a minimum of 6 months and a maximum of 15 years. The most common interval was 5 months to 1 year. About 60% of cases were found to be obese. Soft and weak scar was observed in 70 cases due to previous surgery. Pain and swelling was the most common presenting complaint in 70 patients. In this study, out of 100 cases 40 cases underwent previous surgeries in teaching hospitals, 20 cases in referral hospitals and 40 in others as shown in Figure 1.

About 60% of the patients had a complication of recurrent cough due to previous surgery followed by wound infection in 40%, abdominal distension and wound dehiscence in 20% patients. No complications were noted in 20% patients as in Table 2.

Table 3 presents the type of surgery, anaesthetic procedure and type of incision adopted for the patients in the present study. Elective surgeries were done in 85 cases and emergency surgeries in 15 cases. Most of the patients (50) were anaesthetized by spinal anaesthesia.

Table 4 presents the details of the operative procedures adopted in the present study. Out of 100 cases, 30 cases were presented with intestinal adhesions, 60 with omental adhesions.

No abdominal adhesions were seen in 10 cases. The incisional hernias in 38 cases were repaired by anatomical procedures, 12 by Cattles method, 8 by shoe lace darning, 10 by Keel procedure, 23 cases repaired by Mayo's procedure, 10 by inserting mesh and 1 case treated by Stoppa's procedure. The hernia sac was opened in 40 cases. Sutures at rectus sheath and subcuticular portion were made by prolene in 96 and 4 cases respectively. Vicryl was used for suturing peritoneum in 4 cases and vicryl for suturing subcutaneous portion in 96 cases.Lipectomy was done in 40 obese cases. Tube suction drain (Romovac) was used in 80% of cases in the postoperative period. Ryle's tube aspiration was done in

Table 1: Patients demographic and clinical characteristics.

Characteristics	No. of patients (n=100)
Age (in years)	
20 to 30	4
31 to 40	30
41 to 50	47
51 to 60	18
61 to 70	3
71 to 80	2
Sex	
Males	14
Females	86
Preoperative weight (in kgs)	
41 to 50	5
51 to 60	45
61 to 70	30
> 70	20
Previous surgery	
Abdominal hysterectomy	24
Lower segment caesarian section	20
Postpartum sterilisation	30
Emergency laparotomy	15
Repair of incisional hernia	8
Appendectomy	2
Gastrojejunostomy and vagotomy	1
Duration of complaints	
0 to 6 months	39
6 months to 1 year	23
1 to 2 years	9
2 to 3 years	6
3 to 4 years	4
4 to 5 years	9
5 to 6 years	0
6 to 7 years	2
7 to 8 years	4
8 to 9 years	2
9 to 10 years	1
More than 10 years	1
Nutritional status	
Malnourished	10
Normal build	30
Obese	60
Type of scar	
Normal	18
Thin and papery	2
Soft and weak	70
Hypertrophied	10
Presenting complaints	
Pain and swelling	70
Irreducible swelling	20
Strangulation	10

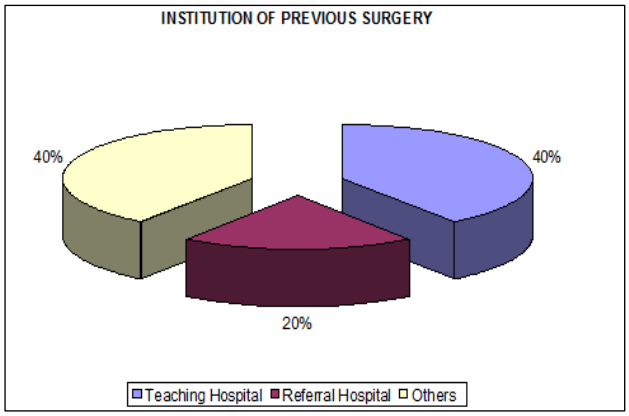

Figure 1: Institution of previous surgery.

Table 2: Complications due to previous surgery.

Complications	Percentage of patient
Cough	60
Abdominal Distension	20
Wound Infection	40
Wound Dehiscence	20
No complications	20

Table 3: Type of surgery and anaesthesia.

Type of surgery	No. of patients (n=100)
Emergency	15
Elective	85
Anaesthesia	
Spinal	50
Epidural	30
General	20

90 cases to prevent distension of the abdomen and to prevent vomiting in the postoperative period for a varying period of time. Foleys catheter was used in 40 patients to drain urine (Table 5). Table 6 presents the immediate and late postoperative complications observed in the patients of the present study. Nausea was the immediate complication observed in about 25 patients followed by wound infection in 16 cases. Pain and induration was the major late complication observed in 60 cases.

Table 7 presents the complications observed in patients operated with different surgical procedures after 1 month follow up. Of all the operative procedures, repair by anatomical method had shown better results compared to others. Out of 38, no complications were seen in 24 patients. Intestinal obstruction was not seen in any of the cases after first review. Recurrence was noted in each case that were operated by Cattle's and Keel's procedure respectively.

Improvement in patient's condition was observed on 2nd review at 3rd month postoperatively. The percentage number of patients without any complaints was increased

compared to the first review in all the types of surgical procedures. Complications such as flap necrosis and lymphorrea were not observed in any of the patients. Intestinal obstruction was noted in 3 patients with anatomical procedure (Table 8).

Table 4: Details of operative procedure.

Findings		Repair		Sac				Use of suture materials		
Intestinal adhesions	30	Anatomical	38	Not opened			60	Material	Site	Cases
		Cattle's	12							
Omental adhesions	60	Shoelace Darning	8	Opened	Omentum Bowel	Viable	10	Prolene (polypropylene)	Rectus sheath	96
		Keel	10			Gangrenous	3		Sub Cuticular	4
No adhesions	10	Mayo's	23			Viable	19		Total	100
		Mesh	8			Gangrenous	8	Vicryl (polyglactin)	Peritoneum	4
Total	100	Stoppa's	1		Total		40	Vicryl (polyglactin)	Sub cutaneous	96
		Total	100	Total			100	Skin staplers	Skin	96

Table 5: Other measures undertaken.

Lipectomy		Drain		Ryle's tube		Foley's catheter	
Done	40	Tube drain	80	Used	90	Used	40
Not done	60	Rubber drain	11	Not used	10	Not used	60
Total	100	No drain	9	Total	100	Total	100

Table 6: Postoperative complications of the present study.

	Hematoma	10
Immediate	Respiratory embarrassment	3
	Abdominal distension	9
	Vomiting	8
	Chest infection	12
	Nausea	25
	Wound infection	16
	Wound dehiscence	2
	Constipation	9
Late	Pain and induration	60
	Flap necrosis	8
	Lymphorrhea	12
	Recurrence	4

Table 7: complications observed on review at 1st month.

Complaints	Anatomical (38)	Cattle's (12)	Darning (8)	Keel (10)	Mayo's (23)	Mesh (9)
No complaints	24	4	2	2	13	5
Pain	10	8	6	8	6	4
Induration	8	6	6	6	4	2
Infection	6	3	2	2	3	0
Flap necrosis	4	1	2	1	0	0
Lymphorrhea	4	2	2	2	1	1
Intestinal obstruction	0	0	0	0	0	0
Recurrence	0	1	0	1	0	0

Table 8: Complications observed on review at 3rd month.

Complaints	Anatomical	Cattle's	Darning	Keel	Mayo's	Mesh
No complaints	30	9	7	8	22	7
Pain	6	2	1	1	1	2
Induration	0	1	0	0	0	1
Intestinal obstruction	3	0	0	0	0	0
Recurrence	0	1	0	1	0	0

Table 9: Complications observed on review at 6th month.

Complaints	Anatomical	Cattle's	Darning	Keel	Mayo's	Mesh
No complaints	32	9	6	8	21	7
Pain	3	3	2	2	2	2
Intestinal obstruction	3	2	0	0	2	0
Recurrence	2	1	1	1	0	0

On 6th month follow up pain was reduced to 50% in patients underwent through anatomical procedure when compared to 3rd review. But the complaint of pain was increased to 50% in patients treated with procedures by darning, Keel, Mayo's and mesh insertion on comparison to previous follow up. Induration was completely not seen in any of the patients. Recurrence was seen in two patients that underwent repair by anatomical procedure and one patient each by Cattles, darning and Keel procedures (Table 9).

DISCUSSION

During the period of 2013-2015 patients of incisional hernia which were treated in the Department of Surgery were included in the study. Majority of the patients (47) were under the age group of 41-50 years. This was consistent with the findings of Ellis et al.[11] Our study showed female preponderance with male to female ratio of 1:6. In the study of Nanjappa et al, male: female prevalence ratio of incisional hernia was 1:3.29. This increased incidence in females might be due to laxity of abdominal muscles due to pregnancy and repeated surgery on the abdominal wall.[12]

In this study about 30% patients who developed incisional hernia was overweight and 20% were obese. Similar observations were noticed by Nanjappa et al in which 40% of the patients were overweight and 13% were grade-I obese out of 30 patients.[12]

In our series, the incidence of incisional hernia was occurred in over 74% of cases due to gynecological procedures (abdominal hysterectomy, lower segment caesarian section, postpartum sterilization). This might be because most of these techniques were done through lower midline incisions. The incidence was 36% in a study by Ponka.[13]

The time interval between the previous operation and the beginning of the abdominal symptoms ranged between a minimum of 6 months and a maximum of 15 years. The most common interval was 5 months to 1 year. In our study, 62 patients developed incisional hernia within a period of 1 year of previous surgery. Similar findings were noted by Ankman et al.[14]

Maximum patients (70) were presented with pain and swelling and other patients with irreducible swelling (20) and strangulation (10). This was in consistent with the findings of Bhamre et al in which pain and swelling was noted in 55.5% of patients.[15]

In this study, the major risk factor for the occurrence of incisional hernia was severe cough in about 60% of patients. This may be due to increased abdominal pressure due to chronic cough.[16] Wound infection was the other predisposing factor for incisional hernia in 40% patients. It was only 11% out of 44 patients in a study done by Agbakwuru et al.[17]

In our series, out of 100 patients, emergency repair of incisional hernia was done in 15 cases and elective repair in 85 cases. On contrary, in a study by Agbakwuru et al, out of 44 patients emergency repair was done in 37 patients and elective repair in 7 cases.[17] Most of the surgeries (50%) were performed by giving spinal anaesthesia.

The technique of the repair was decided by the size of the hernial defect, abdominal muscle tone and general condition of the patient. In the present study, the incisional hernias in 38 cases were repaired by anatomical procedures, 12 by Cattles method, 8 by shoe lace darning, 10 by Keel procedure, 23 cases repaired by Mayo's procedure, 10 by inserting mesh and 1 case treated by Stoppa's procedure. The hernia sac was opened in 40 cases. In a study by Narayanaswamy

anatomical repair was done in 15 cases and repair my mesh in 36 cases.[18]

In our study polypropylene was the material used to suture the incisional site in all the patients. Catgut was used to suture peritoneum in 4 cases and black silk thread to suture skin in 96 cases. Tube suction drain (Romovac) was used in 80% of cases in the postoperative period. Corrugated rubber drain was used in 11 cases. No drain was used in 5 cases. The time of removal of drain depended on the individual case. Mostly (70 cases) it was kept for 48 hours. It was kept for 24 hours in 5 cases and removed on the 5th day in 25 cases. Patients were advised to sit up and walk in the ward on the 3rd day to prevent deep vein thrombosis of the leg veins.

In the present study, the immediate postoperative complication observed majorly was nausea in 25 cases, wound infection in 16 cases, chest infection in 12 cases and hematoma in 10 cases. Pain and induration was the major late complication noticed in 60 cases. In a study conducted by Nanjappa et al the major postoperative complication observed was seroma in 8 (26.7%) out of 30 cases.[12]

In the present study, the follow-up period was variable, ranging between 1 month to 6 months, and no immediate recurrence was observed. After one month follow up recurrence was seen in 2 patients. Intestinal obstruction was not seen in any of the cases after first review. Improvement in patient's condition was observed on 2nd review at 3rd month postoperatively. Complications such as flap necrosis and lymphorrhea were not observed in any of the patients. Induration was completely not seen in any of the patients. Recurrence was seen in 2 patients with anatomical repair and 3 patients one in each in mesh repair process after 6th month follow up. Bhamre et al reported zero percent recurrences in 43 patients who underwent anatomical and mesh repair.[15] Jacobus et al reported a 10-year cumulative rate of recurrence of 63% in anatomical repair and 32% in mesh repair.[19] The recurrence rate thus varies in different studies but all studies favor mesh repair to decrease the recurrence rate.

With thorough patient evaluation, pre-operative skin preparation, selection of accurate operative technique, use of absorbable polypropylene sutures, use of suction drain, use of peri-operative broad-spectrum antibiotics, early ambulation, nasogastric aspiration and chest physiotherapy, complication rates in our study were reduced.

CONCLUSION

Incisional hernia is a relatively common surgical problem more so among females. The vast majority develop incisional hernia due to various gynecological conditions. Among the repair techniques, complications were lesser and recurrence least for those repaired by mesh, darning and transverse double breasting (Mayo's). Also, postoperative period was better in cases where the sac was left unopened (wherever this was possible) with less incidence of abdominal distension, paralytic ileus and with early return to oral feeding. Only non-absorbable materials should be used in hernia repair. Dermolipectomy improves cosmetic appearance as well as reduces recurrence. Use of suction drains reduces the incidence of postoperative seroma and wound infection. Use of an abdominal binder following surgery gives an added security to the patient. A good knowledge in the factors affecting the occurrence of complications and recurrence is required to improve the results of the procedure.

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