

Original Research Article

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Epidemiology and management of ventral hernia in a tertiary health care centre- a prospective observational study

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ABSTRACT

Background: Ventral hernias are a common problem confronting surgeons. Data about standards of their surgical management have failed to keep pace with rapid advances in surgical techniques, and materials. Older techniques have often been discarded simply because of availability of newer ones without due consideration to availability, feasibility, training, local conditions and constraints. Therefore, a balanced, practical and pragmatic opinion regarding surgical management at individual, institutional and regional levels is needed. We studied clinical aspects and best treatment modalities of ventral hernias in our set-up.

Methods: This is a prospective observational study of various types of ventral hernias, surgically managed at a tertiary care hospital between January 2018 and September 2019.

Results: Mean age of presentation among 71 patients (27 males, 44 females) was 48.11 ± 5.71 years. Incisional hernias (30.98%) were the commonest type. Painless swelling (49.29%) was the most common clinical presentation. Obesity (40.84%) and multiparity (30.98%) were the most common associated risk factors. Incisional hernias are probably better managed by open approach.

Conclusions: Ventral hernias are more prevalent in the elderly and females. Incisional, umbilical, epigastric hernias are the more common types. Laparoscopy is being preferred over open procedure due to some advantages that it offers, but incisional hernias can often be better managed by open approach depending upon local set up. In addition, laparoscopic approach is not universally applicable and also has certain drawbacks.

Keywords: Ventral hernias, Surgical management, Postoperative complications

INTRODUCTION

Ventral hernia is a common surgical condition affecting all ages and both sexes. It is an abnormal protrusion of a peritoneal lined sac through the muscular covering of the abdomen.¹

The clinical manifestations range from small incidentally found defects to giant and complicated hernias with loss of abdominal domain. Symptoms range from none or few to severe pain and life-threatening conditions.²

Most common ventral hernias are incisional and paraumbilical hernias which account for 85% of the overall ventral abdominal hernias.³ Incisional hernias are estimated to occur in 11-20% of laparotomy incisions.^{4,5} An increasing interest in laparoscopic surgery and the availability of newer materials have encouraged the adoption of laparoscopic ventral hernia repair (LVHR).

A fresh evaluation of various surgical techniques of ventral hernias is required because the advent of newer techniques and prosthetic materials may have, at least partly, rendered previous studies somewhat outdated, and possibly misleading.

The present study was undertaken to evaluate ventral hernias regarding their epidemiologic aspects, clinical features and various surgical methods employed for their repair in a tertiary care centre.

METHODS

This was a prospective observational study conducted in the department of surgery, Rabindra Nath Tagore Medical College, Udaipur, a tertiary care center in South Rajasthan, India during the period January 2018 to September 2019. Inclusion criteria consisted of all patients undergoing surgical procedures for ventral hernias during this period. Inguinal, femoral, and obturator hernias were excluded from the study. Data was collected after taking proper approval from institutional ethical committee.

Among patients operated for ventral hernia, age, sex, clinical presentations, associated risk factors, various surgical procedures used for repair, postoperative complications and their management were studied and analyzed.

Data was recorded in standardized custom proformas and analyzed using statistical package for the social sciences (SPSS) version 20 software. Descriptive and inferential statistical analysis was carried out. Results on categorical measurements were presented in number (%) and results on continuous measurements were presented as mean \pm SD. Chi square and student's 't' test were utilized as applicable. A p value less than 0.05 was considered as significant.

RESULTS

Incidence of incisional hernia (30.98%) was the highest followed by umbilical (28.16%) and epigastric hernias (23.94%). Overall the male to female ratio was 1:1.63 and incisional hernias were even more common in females (1:2.67) but umbilical hernias were more frequent among males (1.85:1). Most ventral hernias were found in 40-60 year age group patients (53.52%) followed by 20-40 year age group patients (29.57%). Mean age of presentation was 48.11 ± 5.71 years (Table 1).

Overall, most of the patients presented with painless swelling (49.29%). In epigastric hernias pain with or without visible swelling (64.7%) was the most common presentation. Emergency presentations like irreducibility or obstruction (8.45%) were less common (Table 2).

Predisposing factors and co-morbidities

Obesity (40.84%) and multiparity (30.98%) were the most common predisposing risk factors in ventral hernias followed by constipation (9.85%), abdominal distension (7.04%). Diabetes mellitus (9.85%) and chronic obstructive pulmonary disease (COPD) (4.22%) were the most common co-morbidities observed.

Incisional hernias were found to have occurred mainly after laparotomy (31.81%) and gynaecological surgeries like hysterectomy and caesarean section (54.54%). Incidence was highest in midline incisions (72.72%) including midline laparotomy (31.8%) and lower midline incisions (40.91%). Laparoscopic port site incisional hernias were uncommon (4.55%). Incisional hernias were more common among patients who had undergone the primary surgical procedure more than 3 years back (50%). Wound infection and obstructive uropathy (45.46%) were the major complications that had occurred during previous surgeries leading to development of incisional hernias. Similar to their incidence among ventral hernias overall, diabetes mellitus (13.64%) and COPD (9.09%) were the most common associated co-morbidities among patients with incisional hernias also (Table 3).

Surgical management and postoperative course

In emergency cases darning herniorrhaphy was the choice of repair (80%) instead of mesh repair (20%). All elective incisional hernia repairs (100%) were open onlay repairs. Ten ventral hernia patients were managed by laparoscopic technique (Table 4).

Postoperatively all patients with laparoscopic repair were able to start oral feeding on first postoperative day (POD 1) while 81.69% patients with open repairs were able to start feed within 3rd postoperative days. Pain was the most common (25.35%) complaint following ventral hernia repairs followed by fever (n=7, 9.86%) and seroma formation (n=6, 8.45%). Patients undergoing elective hernioplasty suffered lesser complications as compared to emergency repair such as wound dehiscence, pelvic collection etc. which were statistically highly significant ($p<0.001$) (Table 5).

Majority (80.33%) of patients who underwent open repair had their drains removed by POD 4. No drain was used in laparoscopic procedure.

Patients who underwent open surgery had longer hospital stay compared to laparoscopic procedures (mean- 6.9 days versus 2.6 days) (Figure 1).

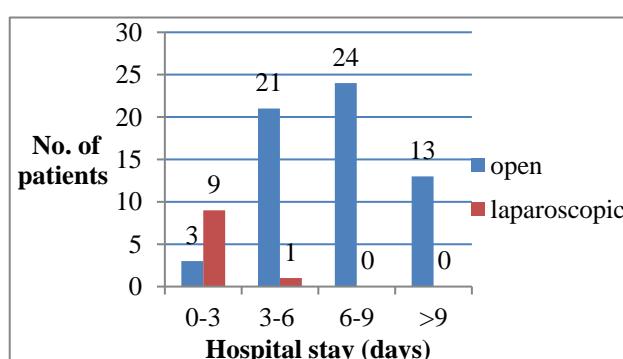


Figure 1: Pictorial depiction of hospital stay for ventral hernia repairs.

Table 1: Demographic distribution of ventral hernia.

Type of hernia	No.	Age/sex									
		0-20 years		20-40 years		40-60 years		>60 years			
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Incisional	22	1	-	-	3	5	11	-	2		
Umbilical	20	1	-	3	3	9	3	-	1		
Epigastric	17	-	-	1	4	-	5	3	4		
Supraumbilical	6	-	-	2	2	2	-	-	-		
Paraumbilical	6	-	-	-	3	1	2	-	-		
Total	71	2	-	6	15	17	21	3	7		

Table 2: Clinical presentations of various types of ventral hernias in the present study.

Type of hernia	Chief complaints (%)				Total
	Pain	Swelling	Pain with swelling	Irreducibility or obstruction	
Umbilical	1 (1.41)	14 (19.72)	4 (5.63)	1 (1.41)	20 (28.17)
Supraumbilical	1 (1.41)	3 (4.23)	2 (2.82)	0 (0.00)	6 (8.45)
Paraumbilical	0 (0.00)	3 (4.23)	1 (1.41)	2 (2.82)	6 (8.45)
Incisional	1 (1.41)	11 (15.49)	9 (12.68)	1 (1.41)	22 (30.99)
Epigastric	6 (8.45)	4 (5.63)	5 (7.04)	2 (2.82)	17 (23.94)
Total	9 (12.68)	35 (49.30)	21 (29.58)	6 (8.45)	71 (100.00)

Table 3: Various surgical procedures associated with occurrence of incisional hernia.

Type of previous surgery	No. of cases (n=22)
Laparoscopy	1 (4.55)
Tubectomy	2 (9.09)
Hysterectomy	6 (27.27)
Caesarean section (classical/ LSCS)	6 (27.27)
Laparotomy	7 (31.82)
Appendectomy	0 (0.00)
Total	22

Table 4: Various surgical procedures performed in management of ventral hernias.

Type of hernia	Type of operative management				Total (n=71)
	Emergency (n=5) %	Darning herniorraphy	Mesh plasty	Elective (n=66) %	
				Open onlay	Laparoscopic
Umbilical	1 (20)	0	15 (22.73)	4 (6.06)	20
Supra umbilical	0	0	4 (6.06)	2 (3.03)	6
Para umbilical	2 (40)	0	4 (6.06)	0 (0.00)	6
Incisional	0	0	22 (33.33)	0 (0.00)	22
Epigastric	1 (20)	1 (20)	11 (16.67)	4 (6.06)	17
P value	>0.05 (NS)		<0.05 (S)		

Table 5: Postoperative complications after emergency and elective hernia repair surgeries.

Postoperative complications	Type of surgical repair (%)		No. of cases (n=71) (%)
	Emergency repair (n=5)	Elective repair (n=66)	
Pain	4 (80.00)	14 (21.21)	18 (25.35)
Pelvic collection	3 (60.00)	0 (0.00)	3 (4.23)
Wound dehiscence	3 (60.00)	1 (1.52)	4 (5.63)
Seroma formation	3 (60.00)	3 (4.55)	6 (8.45)
Fever	2 (40.00)	5 (7.58)	7 (9.86)

Continued.

Postoperative complications	Type of surgical repair (%)		No. of cases (n=71) (%)
	Emergency repair (n=5)	Elective repair (n=66)	
Mesh infection	0 (0.00)	0 (0.00)	0 (0.00)
Nil	2 (40.00)	31 (46.97)	33 (46.48)

DISCUSSION

The age incidence reported in the present study is in agreement with findings of many previous studies (Table 6). The observed higher incidence of ventral hernia in the not so young and older age groups can be explained on the basis of laxity of abdominal wall and increased risk associated with factors like obesity, obstructive uropathy, and diabetes in old age.

Table 6: Age incidence of ventral hernia patients in earlier studies.

Authors	Age range	Mean age (years)
Jaykar ⁶	61-70	41
Carlson ⁹	25-90	60.3
Present study	18-90	48.11

We found that ventral hernias were more common in females (61.97%) than in males (38.02%). Male to female ratio was 1:1.63. Similar observations were made in the studies conducted by Jaykar (1:1.95) and Alenazi (1.73:1).^{6,7} Similarly, it was also observed that incisional hernias were seen more commonly in females (72.73%) as compared to males (27.27%). Our findings are in concurrence with those of Sharath in which females outnumbered males with the ratio of 4:1.⁸ The preponderance of these hernias among females may be due to larger number of lower abdominal surgeries in which incisional hernias occur commonly, less muscular build up, multiple child births and gynaecological surgeries in females.

Umbilical hernias were observed to be more common in males (65%) than females (35%) with ratio 1.85:1. Males (65.63%) have been reported to have larger incidence of umbilical hernia than females (34.37%).⁹ A low prevalence of congenital umbilical hernia in females may be a contributory factor for lower incidence in females.

With regard to types of ventral hernias, findings of present study are in accordance with previous studies (Table 7). The high incidence of incisional hernias may be due to increased number of surgeries in modern day practice and the complications associated with them. Umbilical hernias are more common because of congenital defect in the development of umbilicus.

In this study, most of the patients presented with painless swelling (49.29%). Pain with or without visible swelling (64.70%) was noted to be a common symptom in epigastric hernias. Obstruction and irreducibility (8.45%) were uncommon presentations in our study. In a study 64% patient presented with swelling without pain while 20%

patients showed pain along with swelling and 16% had features of obstruction or irreducibility along with swelling.⁶ The findings of many studies are in agreement with the findings of the present study.^{10,11} It may be due to visibility of swelling leading to early detection by the patients. On the other hand, epigastric hernias can be very painful even when the swelling is quite small, due to the fatty contents becoming nipped sufficiently to produce partial strangulation. Early detection and management can reduce the incidence of irreducibility or obstruction.

Table 7: Incidences of a various types of ventral hernias.

Type of hernia	Present study (%)	Jaykar ⁶ (%)	Bose ¹² (%)
Umbilical	20 (28.17)	32	25.13
Paraumbilical	6 (8.45)	-	-
Supraumbilical	6 (8.45)	-	-
Incisional	22 (30.99)	44	62.86
Epigastric	17 (23.94)	10	12

In our study we noted higher occurrence of incisional hernia after laparotomy (31.81%) and gynaecological surgeries like hysterectomy and caesarean section (54.54%). Similar to ours, Bose also reported more number of incisional hernias cases after previous gynaecological surgeries.¹² It is possible that larger extent of surgeries and more anatomic disruption involved in laparotomy may be responsible for more consequent incisional hernias. On the other hand gynaecological surgeries involve infra umbilical region where the abdominal wall is weak due to the absence of posterior rectus sheath.

Overall, majority of ventral hernias were repaired by open procedures. All incisional hernias were managed by open onlay repair technique due to expected adhesions in these patients, laparoscopic repair was not considered feasible. Laparoscopic method was preferred for umbilical (n=4), supra-umbilical (50%) and epigastric hernias (n=4) and in patients with no other associated co-morbidities. In emergency situations, darning herniorraphy was preferred to meshplasty due to increased chances of mesh infection in emergency settings. This pattern of choice of ventral hernia repair was a result of many factors including feasibility, condition of patients, availability of resources and training. Notably, however, the results of these procedures were satisfactory, and combined with the possibility of being able to offer them to a larger number of patients makes these procedures very useful and far from obsolete.

Laparoscopic repair of ventral hernia is showing promising results and is being widely practiced now-a-

days.^{13,14} Postoperative pain and hospital stay is lesser and there is faster resumption of routine activities after laparoscopic procedure. In the present study in patients with laparoscopic procedures oral feed was started on very next postoperative day, while in open procedure mean duration to begin oral feed was 2.62 days. No surgical drains were used in laparoscopic procedures, while mean duration of in-situ drains in open procedures was 3.77 days. Similar findings were observed by Rubby, who noted mean postoperative hospital stay to be shorter for the laparoscopic group than for the open hernia repair group (2.66 versus 6.88 days).¹³ Return to activity or normal daily routine has been reported significantly less in laparoscopic repair group as compared to open hernia repair group (4.13 versus 13.98 days). These findings mean that laparoscopic ventral hernia repairs have their advantages but in situations of financial or training crunch, emergencies and co-mobidities, the traditional, open repairs are likely to maintain their place.

In the present study, pain (25.35%) was the most common complaint after hernia repair and most of the cases (46.47%) showed no postoperative complications. Complications like wound dehiscence and seroma formation were more prevalent in emergency procedures. Sharath reported that the incidence of complications was almost 50% in open surgeries while it was around 20% in laparoscopic surgeries.⁸ Rubby observed fewer intra and post-operative complications like seroma (4% in laparoscopic procedure versus 16% in open procedure), wound infection (2% in laparoscopic procedure versus 20% in open procedure) among the patients who underwent laparoscopic repair than among those who had open repair.¹³

The findings of these studies were in disagreement with the findings of the present study in regards of postoperative complications in open hernia repairs. It can be inferred from the superior results of the present study in surgical treatment of ventral hernias that good pre and post-operative management, a clear understanding of factors involved in hernia surgery and good technique can go a long way in ensuring superior results.

Mean hospital stay in open procedures (8.49 days) was more than in laparoscopic procedures (3.5 days). Similarly Sharath reported mean duration of hospital stay in patients with open and laparoscopic procedures to be 6.45 days and 4.10 days respectively.⁸

In spite of all the advantages, laparoscopic repair may have several disadvantages like need for general anaesthesia, higher operative cost, incompatibility for patient's status like cardiorespiratory insufficiency, abnormalities of haemostasis and ascites. Open hernia repair is preferred for very large hernias, irreducible and strangulated hernias, especially when there is gangrenous bowel, recurrent hernia repairs, poor economic status, and also is feasible in compromised patient status.

CONCLUSION

In conclusion, we found ventral hernias to be more prevalent in the elderly and females. Incisional, umbilical, epigastric hernias were the more common types. Obesity, multiparity, obstructive uropathy, constipation, and COPD were the major risk factors for ventral hernias. Laparotomy, gynaecological procedures and midline incisions were found to be major risk factors for development of incisional hernias. Occurrence of incisional hernia seems to depend on previous surgical techniques and complications such as surgical site infections. Although laparoscopic procedures are being preferred over open procedure due to certain advantages that it offers, but incisional hernias are probably better managed by open approach. In addition, laparoscopic approach is not universally applicable and also has certain drawbacks making open ventral hernia repair a viable option even in the present era of laparoscopic surgery.

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Conflict of interest: None declared

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