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Study to evaluate ventral hernias regarding their epidemiologic aspects, clinical features and various surgical methods employed for their repair: an observational study

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ABSTRACT

Aim: The aim of the present study was to evaluate ventral hernias regarding their epidemiologic aspects, clinical features, and various surgical methods employed for their repair.

Methods: This was a prospective observational study conducted in the Department of Trauma & Emergency Medicine for 2 years. A total of 100 patients were included in the current study.

Results: The incidence of incisional hernia (30%) was the highest followed by umbilical (26%) and epigastric hernias (25%). Overall, the incisional hernias were even more common in females but umbilical hernias were more frequent among males. Most ventral hernias were found in 40-60 year age group patients (56%) followed by 20-40 year age group patients (29%). The mean age of presentation was 48.12±5.75 years. Overall, most of the patients presented with painless swelling. In epigastric hernias, pain with or without visible swelling was the most common presentation. Emergency presentations like irreducibility or obstruction were less common. Incisional hernias were found to have occurred mainly after laparotomy (30%) and gynecological surgeries like hysterectomy and cesarean section (53.33%). Laparoscopic port site incisional hernias were uncommon (6.66%). In emergency cases, darning herniorrhaphy was the choice of repair instead of mesh repair. All elective incisional hernia repairs (100%) were open onlay repairs. Pain was the most common complaint following ventral hernia repairs followed by fever and seroma formation. Patients undergoing elective hernioplasty suffered fewer complications than emergency repair such as wound dehiscence, pelvic collection, etc. which were statistically highly significant ($p<0.001$).

Conclusion: We found ventral hernias to be more prevalent in the elderly and females. Incisional, umbilical, and epigastric hernias were the more common types. Laparotomy, gynecological procedures and midline incisions were found to be major risk factors for the development of incisional hernias.

INTRODUCTION

Incisional hernias and ventral abdominal hernias are defects in the fascia of the abdominal wall, and are a common occurrence in people undergoing open abdominal surgery.[1] The consequences can range from asymptomatic presence of disease, and cosmetic disfigurement to severe consequences like strangulation of herniated bowel segments.[2] But as documented by numerous studies, the negative effect of these hernias on a person's quality of life can be very significant.[3,4]

Traditionally open surgical repair has been the mainstay of the treatment for incisional hernia repair.[2,4,5] But in the last few years, many randomized controlled trials, comparing open and laparoscopic approaches have proposed laparoscopic approach may offer several advantages and may result in better outcomes.[6-9] In recent times, the focus of surgical outcomes is taking a

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paradigm shift from traditional and surgeon-centered approaches to postoperative complications, recurrence rates, etc.[10,11]

The word hernia originated from the Latin word which means rupture. It occurs when an organ that is normally contained in a body cavity protrudes through the lining of that cavity.[12] A ventral hernia is defined as a protrusion through the anterior abdominal wall fascia. These anterior abdominal wall fascia defects can be categorized into two categories- spontaneous (or primary) or acquired (incisional). These can also be classified by their location on the abdominal wall. An epigastric hernia may occur from the xiphoid process to the umbilicus, an umbilical hernia occurs over the umbilicus, and a hypogastric hernia occurs below the umbilical level. An acquired hernia occurs on a previously operated site and hence is termed an incisional hernia.[13]

In October 2008, the European Hernia Society (EHS) introduced an elaborated classification of ventral hernias.[14] Ventral hernias may or may not be symptomatic. They typically show up as an abdominal swollen with or without pain; complications such as imprisonment or strangulation are infrequent. The incisional hernia is a common long-term complication of abdominal surgeries and the incidence ranges from 2-20%.[15,16] The overall incidence of incisional hernia is slightly higher in the midline laparotomy incision as compared to the transverse incision.[16]

The aim of the present study was to evaluate ventral hernias regarding their epidemiologic aspects, clinical features, and various surgical methods employed for their repair.

MATERIALS AND METHODS

This was a prospective observational study conducted in the Department of Trauma & Emergency Medicine at a level 1 trauma center in central India for 2 years. The sample size of this study was 100. 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.

Among patients operated on 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 a 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±SD. Chi-square and student's 't' test were utilized as applicable. A p-value of less than 0.05 was considered as significant.

RESULTS

Table 1: Demographic distribution of ventral hernia patients

		Age/sex							
Type of hernia	**No.**	**0-20 years**		**20-40 years**		**40-60 years**		**>60 years**	
		Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Incisional	30	2	-	-	4	6	16	-	2
Umbilical	26	2	-	4	4	12	3	-	1
Epigastric	25	-	-	2	5	-	10	3	5
Supraumbilical	10	-	-	3	3	4	-	-	-
Paraumbilical	9	-	-	-	4	2	3	-	-
Total	100	4	-	9	20	24	32	3	8

Incidence of incisional hernia (30%) was the highest followed by umbilical (26%) and epigastric hernias (25%). Overall the incisional hernias were even more common in females but umbilical hernias were more frequent among males. Most ventral hernias were found in 40-60 year age group patients (56%) followed by 20-40 year age group patients (29%). The mean age of presentation was 48.12±5.75 years.

Table 2: Clinical presentations of various types of ventral hernia patients

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Type of hernia	Chief complaints (%)				
	Pain	Swelling	Pain with swelling	Irreducibility or obstruction	Total
Incisional	2	16	10	2	30
Umbilical	2	18	5	1	26
Epigastric	9	6	8	2	25
Supraumbilical	3	4	3	0	10
Paraumbilical	0	4	2	3	9
Total	16	48	28	8	100

Overall, most of the patients presented with painless swelling. In epigastric hernias pain with or without visible swelling was the most common presentation. Emergency presentations like irreducibility or obstruction were less common.

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

Type of previous surgery	No. of cases (n=30)
Laparoscopy	2 (6.66)
Tubectomy	3 (10)
Hysterectomy	8 (26.66)
Cesarean section (classical/ LSCS)	8 (26.67)
Laparotomy	9 (30)
Appendectomy	0
Total	30

Incisional hernias were found to have occurred mainly after laparotomy (30%) and gynecological surgeries like hysterectomy and cesarean section (53.33%). Laparoscopic port site incisional hernias were uncommon (6.66%).

Table 4: Various surgical procedures performed for the management of ventral hernias

Type of hernia	Type of operative management				Total (n=100)
	Emergency (n=10)		Elective (n=90)		
	Darning herniorrhaphy	Mesh plasty	Open onlay	Laparoscopic	
Umbilical	2	0	18	6	26
Supra umbilical	0	0	6	4	10
Para umbilical	4	0	5	0	9
Incisional	0	0	30	0 (0.00)	30
Epigastric	2	2	16	5	25
P value	>0.05		<0.05		

In emergency cases darning herniorrhaphy was the choice of repair instead of mesh repair. All elective incisional hernia repairs (100%) were open onlay repairs.

Table 5: Postoperative complications after emergency and elective hernia repair procedures

Postoperative complications	Type of surgical repair		No. of cases (n=100)
	Emergency repair (n=10)	Elective repair (n=90)	
Pain	8	17	25
Pelvic collection	6	0	6
Wound dehiscence	5	1	6

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Seroma formation	6	2	8
Fever	4	6	10
Mesh infection	0	0	0

The pain was the most common complaint following ventral hernia repairs followed by fever and seroma formation. Patients undergoing elective hernioplasty suffered fewer complications than emergency repair such as wound dehiscence, pelvic collection, etc. which were statistically highly significant ($p<0.001$).

DISCUSSION

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.[17]

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.[18] Most common ventral hernias are incisional and para-umbilical hernias which account for 85% of the overall ventral abdominal hernias.[19] Incisional hernias are estimated to occur in 11-20% of laparotomy incisions.[20,21] An increasing interest in laparoscopic surgery and the availability of newer materials have encouraged the adoption of laparoscopic ventral hernia repair (LVHR).

Incidence of incisional hernia (30%) was the highest followed by umbilical (26%) and epigastric hernias (25%). Overall the incisional hernias were even more common in females but umbilical hernias were more frequent among males. Similar observations were made in the studies conducted by Jaykar (1:1.95) and Alenazi (1.73:1).[22,23] Most ventral hernias were found in 40-60 year age group patients (56%) followed by 20-40 year age group patients (29%). The mean age of presentation was 48.12±5.75 years. Multiple factors such as multiparity, decreased abdominal muscle tone, replacement of collagen tissues, history of gynecological surgeries through a lower midline incision, etc., predispose females to ventral hernias.[16.24] Overall, most of the patients presented with painless swelling. In epigastric hernias, pain with or without visible swelling was the most common presentation. The findings of many studies are in agreement with the findings of the present study.[25,26] It may be due to the 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.

Emergency presentations like irreducibility or obstruction were less common. Incisional hernias were found to have occurred mainly after laparotomy (30%) and gynecological surgeries like hysterectomy and cesarean section (53.33%). Laparoscopic port site incisional hernias were uncommon (6.66%). Similar to ours, Bosealso reported more incisional hernias cases after previous gynaecological surgeries.[27] In emergency cases darning herniorrhaphy was the choice of repair instead of mesh repair. All elective incisional hernia repairs (100%) were open onlay repairs. Pain was the most common complaint following ventral hernia repairs followed by fever and seroma formation. Patients undergoing elective hernioplasty suffered fewer complications than emergency repair such as wound dehiscence, pelvic collection, etc. which were statistically highly significant ($p <0.001$). In emergencies, 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 these procedures very useful and far from obsolete.

CONCLUSION

We found ventral hernias to be more prevalent in the elderly and females. Incisional, umbilical, and epigastric hernias were the more common types. Laparotomy, gynecological procedures, and midline incisions were found to be major risk factors for the development of incisional hernias. The occurrence of incisional hernia seems to depend on previous surgical techniques and complications such as surgical site infections. Although laparoscopic procedures are preferred over open

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procedures due to certain advantages that they offer, incisional hernias are probably better managed by an open approach. In addition, the 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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