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A Clinical Study of Ventral Hernias in Tertiary Hospital, Goa Medical College

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Abstract

Background: Ventral hernias are commonly encountered problems in the field of general surgery. Less data is available as to its natural history and hence surgeons prefer surgical treatment. Incisional hernia is a common complication following abdominal surgery that requires reoperation.

Aims and Objectives: To study the incidence of ventral hernias, its causes and modes of presentation with the changing trends, various treatment modalities and complications of surgeries and mortality and morbidity owing to ventral hernia.

Materials and Methods: This prospective observational study was conducted in the Department of Surgery, Goa Medical College, on a total of 100 patients between May 2019 to March 2021. Detailed history was recorded in all cases. This includes age, sex, weight of the patients. Presence of predisposing factors like obesity and particulars regarding diseases like hypertension, diabetes and other complications were elicited and treatment for the same was undertaken. The data was analyzed using SPSS software.

Results: Females were affected more than males. 49% patients complained of swelling, while 23% complained of swelling and pain and about 20% complained of only pain. Para umbilical and incisional hernias were the most common types of hernias diagnosed in the study majority (86 out of 100) had no complications. However, those who did have complications, the most common was infection which was seen among 14% of the participants. 8% had seroma and 5% each had ileus and dehiscence. The recurrence rate was only 3%.

Conclusion: Ventral hernia tend to present mainly in the 40- to 60-year age with male to female ratio tends to be 2:1. Para umbilical with umbilical hernia were most common types followed by Incisional hernia. Swelling and pain were the major presenting symptoms. Mesh repair was being more frequently used, compared to primary suture repair.

Keywords: Hernia; Clinical study; Incisional; Gastroenterology; Mesh Repair

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Introduction

The word hernia is derived from the Latin word meaning rupture. It occurs when an organ that is normally contained in a body cavity protrudes through the lining of that cavity [1]. A ventral hernia is defined as a protrusion through the anterior abdominal wall fascia. These defects on the anterior abdominal wall fascia can be categorized into spontaneous (or primary) or acquired (incisional). They can also be categorized by their location on the abdominal wall. An epigastric hernia occurs from the xiphoid process to the umbilicus, an umbilical hernia occurs at the umbilicus, and the hypogastric hernia occurs below the umbilicus. An acquired hernia occurs on a previously operated site and hence is termed an incisional hernia [2]. Ventral hernias may or may not be symptomatic. They usually present as a swelling over the abdomen associated with or without pain and rarely with complications like strangulation or incarceration. The incisional hernia is a common long-term complication of abdominal surgeries and the incidence ranges from 2% to 20% [3,4]. The overall incidence of incisional hernia is slightly higher in the midline laparotomy incision as compared to the transverse incision [4]. Less data is available as to its natural history and hence surgeons prefer surgical treatment as there are few prospective cohort studies available [5].

Hence this study was done to evaluate the incidence of ventral hernias, its causes and modes of presentation with the changing trends, various treatment modalities and complications of surgeries along with the morbidity and mortality in relation to ventral hernia.

Materials and Methods

One-hundred (100) cases of Ventral hernia admitted in the Department of General Surgery Goa Medical College hospital during the period of May 2019 to March 2021 were studied. Detailed case history was recorded. This included age, sex, weight of the patients and special attention was paid to, type of incision, postoperative healing of wound and duration between surgery and development of hernia. Presence of predisposing factors like obesity and particulars regarding diseases like hypertension, diabetes and other complications were elicited and treatment for the same was undertaken.

Inclusion criteria: All patients with ventral hernia more than age of 14 years.

Exclusion criteria: Recurrent hernias, pediatric age group & patients below 12 years, patients with congenital abdominal wall weakness and presenting in the emergency setting.

Clinical diagnosis was made, patients with medical illness were appropriately treated to attain near normal parameters before surgery. The type of anesthesia used was spinal anesthesia and general anesthesia in selected patients. At the induction of anesthesia, a single dose of preoperative broad-spectrum antibiotic given followed by the same for 3 to 5 days postoperatively. Patients were assigned to undergo suture repair or mesh repair at operating surgeon's discretion.

Preoperative treatment included: Correction of anemia, attempt at weight reduction if obese, improvement of nutritional status, treatment of respiratory infection if any, abstinence from smoking/ alcohol if any, advice regarding breathing exercises.

The patients were taken up for surgery after written and informed consent. The findings were then recorded and the patients were monitored carefully for pain, bleeding, paralytic ileus, seroma and hematoma, wound infection and wound gaping. Pain was assessed using verbal graphic rating scale. The patients were discharged when fit and asked to come for regular follow up after 15 days, 1 month, 3 months, 6 months, 1 year and 2 years. Different patients were followed up for different periods with many dropouts. The patients were advised to return to pre-hernia lifestyle except lifting heavy weights. All were followed-up for postoperative pain, interference with activities of daily living, use of analgesics and recurrence.

Statistical analysis: The data was entered in proforma, tabulated, and analyzed with SPSS Statistics for Windows, Version 21.0.

Results

The mean age of the participants was 50.9 years. It was seen that majority of the participants belonged to the age group of 41 to 50 years (33%), followed by 21% who belonged to the age group of 51 to 60 years. The least number of participants belonged to the age group of 81 to 90 years (2%) (Table 1). It was found that most of the participants were females (53%) while the remaining were males (47%) (Table 2). It was found that the, most common symptom experienced by the participants was swelling (49%). This was followed by a combination of swelling and pain in 23% of the participants. Pain was experienced by 20% and irreducibility was found among only 8% (Table 1). It was seen that majority (61%) of the participants were diagnosed with the Para umbilical type of hernia. 30% of them were diagnosed with the incisional type of hernia, followed by 4% each of umbilical and epigastric type of hernia and the least (1%) with Spigelian type of hernia (Table 1). A large number of participants (62%) had undergone the mesh repair procedure, followed by 35% who underwent an anatomical repair procedure for the treatment of hernia. The least number of participants (3%), opted for the laparoscopic mesh repair procedure for the treatment of hernia (Table 1). Majority of the participants did not encounter any of the complications, 14% of them had infection. 8% of the participants had experienced seroma while 5% each had experienced ileus and dehiscence (Graph 1). There were 97% of the participants included in the study who reported no recurrence while 3% reported a recurrence (Table 1).

Multiple risk factors were evaluated these were obesity, diabetes, COPD, anemia, hypertension, smoking, alcohol consumption and previous wound infection. Majority of the participants did not report the risk factors mentioned. However, the most common risk

Table 1: Patient characteristics.

Characteristics		Frequency (n=100)	Percent
Age	20-30 years	4	4
	31-40 years	18	18
	41-50 years	33	33
	51-60 years	21	21
	61-70 years	12	12
	71-80 years	10	10
	81-90 years	2	2
Gender	Male	47	47
	Female	53	53
Symptoms	Swelling	49	49
	Pain	20	20
	Swelling + Pain	23	23
	Irreducibility	8	8
Type of hernia	Incisional	30	30
	Para umbilical	61	61
	Umbilical	4	4
	Epigastric	4	4
	Spigelian	1	1
Operative procedure	Anatomical Repair	35	35
	Mesh Repair	62	62
	Laparoscopic Mesh Repair	3	3
Recurrence	Yes	3	3
	No	97	97

Table 2: Frequency distribution of participants based on risk factors.

Risk factor	Yes		No	
	Frequency	Percent	Frequency	Percent
Obesity	18	18	82	82
Diabetes	23	23	77	77
COPD	10	10	90	90
Anemia	4	4	96	96
Hypertension	14	14	86	86
Smoking	20	20	80	80
Alcohol	15	15	85	85
Previous Wound Infection	16	16	84	84

Table 3: Frequency distribution of participants with incisional hernia based on previous surgery, type of incision and period between past surgeries.

Characteristics		Frequency (n=30)	Percent
Previous surgery	Laparotomy	12	40
	Hysterectomy	7	23.3
	LSCS	7	23.3
	Tubectomy	1	3.33
	Perf Appendix	1	3.33
	Cholecystectomy	2	6.66
Type of incision	Lower midline	13	43.33
	Upper + Lower midline	6	20
	Rt Paramedian	3	10
	pfannenstiel	7	23.3
	Subcostal	1	3.33
Period between past surgery	Less than 1 Year	17	56.66
	1 to 5 Year	8	26.66
	5 to 10 Years	3	10
	Greater Than 10 years	2	6.66
Total		30	100

factor reported by the participants was diabetes with 23% of the participants reporting the same. This was followed closely by 20% of the participants who were smokers, 18% who were obese, 16% with previous wound infection, 15% who were or are alcoholics, 14% with hypertension, 10% with COPD and only 4% with anemia (Table 2). The most common operative procedure was the mesh repair. However, for complications ileus, seroma and paraumbilical type of hernia a close number of participants also underwent the anatomical repair (Table 3).

A positive correlation was observed with complications infection and dehiscence as well as recurrence with the operative procedure (Table 4). Most of the participants did not suffer from the complications of surgery as well as a small number actually reported recurrence (Table 5).

Table 5: Correlation of complications and recurrence.

Characteristics		Recurrence		Correlation
		Yes	No	
Complication ileus	Yes	0 (0)	5 (5)	-0.04
	No	3 (3)	92 (92)	
Complication seroma	Yes	0 (0)	8 (8)	-0.052
	No	3 (3)	89 (89)	
Complication infection	Yes	3 (3)	11 (11)	0.436
	No	0 (0)	86 (86)	
Complication dehiscence	Yes	2 (2)	3 (3)	0.498
	No	1 (1)	94 (94)	

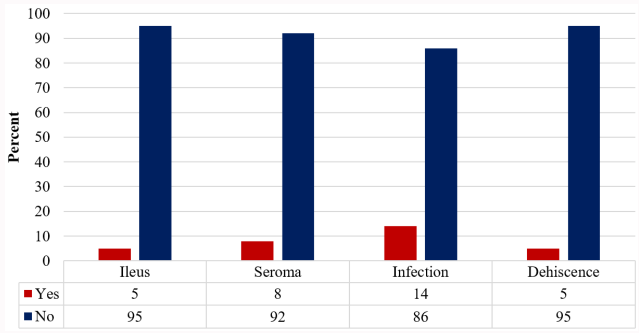
Discussion

The present study outlined the descriptive aspects of the various types of hernias, the causes and the treatment modalities of the same. The study also focused on the complications encountered by the participants post-surgery. The age group of the participants included in this study ranged from 20 years to above 80 years. Considering this was a wide age range, they were divided into intervals of 10 years. Most of the participants were in the age range of 41 to 50 years and 51 to 60 years, followed by 31 to 40 years. In a study conducted by Harikrishnan et al. [6] in 1993, maximum cases of ventral hernia were between the age group of 30 to 50 years. In a study by Basta in 2019 [7], under 45 years the prevalence of incisional hernia was (in percentage) 29.7%, 45 to 65 – 46.7% and above 65 y – 23.5%, these results are similar to the outcome of the present study (Figure 1, 2).

According to the study conducted by de Silva (1991) there was increased incidence of ventral hernia in females (81%) [8]. In study by Basta 2019 [7], 36.6% were male while 63.4% were female patients with overall M:F ratio 1:2 approx. confirming a female preponderance of incisional hernia. Ellis, Gajraj and George obtained an incidence of incisional hernia in 64.6% of female population in their study of 383 patients [6] in the present study 53% of the cases were females while

Table 4: Association and correlation of complications, recurrence and type of hernia with the operative procedure.

Characteristics		Operative Procedure			Sig.	Correlation
		Anatomical Repair	Mesh Repair	Laparoscopic Mesh Repair		
Complication ileus	Yes	2 (2)	3 (3)	0 (0)	0.905	0.035
	No	33 (33)	59 (59)	3 (3)		
Complication seroma	Yes	4 (4)	4 (4)	0 (0)	0.6	0.101
	No	31 (31)	58 (58)	3 (3)		
Complication infection	Yes	3 (3)	11 (11)	0 (0)	0.356	-0.081
	No	32 (32)	51 (51)	3 (3)		
Complication dehiscence	Yes	0 (0)	5 (5)	0 (0)	0.199	-0.139
	No	35 (35)	57 (57)	3 (3)		
Recurrence	Yes	0 (0)	3 (3)	0 (0)	0.388	-0.107
	No	35 (35)	59 (59)	3 (3)		
Type of hernia	Incisional	5 (5)	25 (25)	0 (0)	**0.000***	0.005
	Paraumbilical	28 (28)	31 (31)	2 (2)		
	Umbilical	1 (1)	3 (3)	0 (0)		
	Epigastric	1 (1)	3 (3)	0 (0)		
	Spigelian	0 (0)	0 (0)	1 (1)		



Graph 1: Frequency distribution of participants based on the complications.

Figure 1: Picture of component separation technique.

Figure 2: Laparoscopic ventral hernia repair.

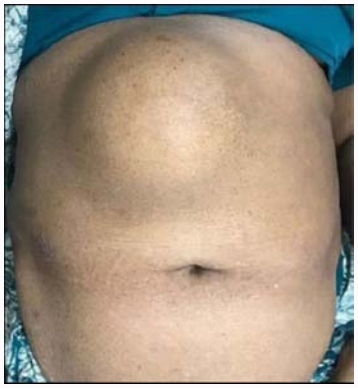


Figure 3: Picture of epigastric hernia.

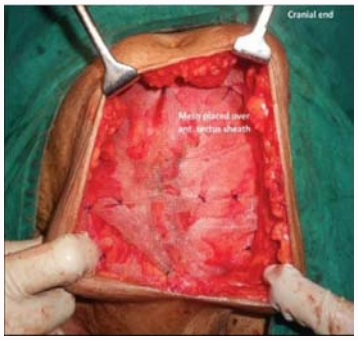


Figure 4: Open mesh repair.

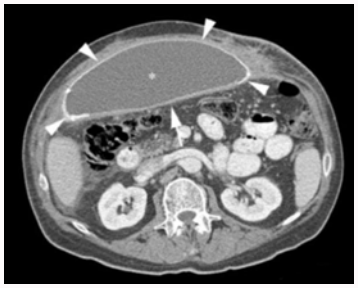


Figure 5: CT scan demonstrating seroma post hernia repair.

47% were males. Hence it can be considered that there is increased incidence in females, which is comparable to above study.

The present study evaluated the major symptoms experienced by the subjects. 49% complained of swelling, while 23% complained of swelling and pain and about 20% complained of only pain. Only 8% of the cases reported with the symptom of irreducibility. In a study conducted by Subhash Chavan [9], pain was the major symptom in 18.9% and irreducibility 7.466, which are comparable to the present study.

According to study by Vaz [10], prevalence of diabetes was 10% in Goa. According to Gats [11], 4.8% of adults smoked of which 18.2% were males and 0.9% were females. In the present study, the most common risk factor for overall hernia incidence was diabetes in 23% of the participants. Smoking was also seen as a risk factor in 20%, obesity in 18% and previous wound infection in 16% of the participants of the study. Bhaskaran et al. [12], found that the associated risk factors for hernia were diabetes mellitus in 16%, Obesity in 20%, grand multi para in 10% and COPD in 4% of the subjects included in their study. Jaykar [13] in a study, found constipation to be the commonest risk factor with 34% with obesity and smoking to be second with 16%. Study by Priti Shah found obesity 21.5% to be the commonest risk factor followed by smoking 19.5% and diabetes and COPD each accounting for 17% [14].

The participants in the present study were also classified based on the type of hernia. Accordingly, it was found that, para umbilical and incisional hernias were the most common types of hernias diagnosed in the study population with 61% and 30% respectively. A study carried out by Priti shah [14], incisional hernia was 41%, para umbilical 49% and epigastric hernia accounted for remaining 10%, which are comparable. In the study by Jaykar [13], incisional hernia accounted for 46% and para umbilical hernia for 44% (Figure 3).

The present study also found that 56.5% of the participants who reported with incisional hernia, came to the department in less than one year of previous surgery. 26.66% reported within 1 to 5 years post-surgery. The study by Hoer et al. [15] revealed that 31.5% of all incisional hernias developed in the first 6 months after the operation,

Figure 6: Picture of incisional hernia post laparotomy.

54.4% after 12 months, 74.8% after 2 years and 88.9% after 5 years. Mudge and Hughes [16] showed that, 56% developed incisional hernia within 1st postoperative year and 35% after 5 years.

The most common type of operative procedure that was opted for in the present study was the mesh repair, accounting for a total of 62% of the participants. In study by Mikael Lindmark [17], of 408 patients, the most common repair procedure was mesh repair with 86% (open mesh repair being 62 and ipom 24%) (Figure 4, 5). In Chavan [9] study of 136 cases (88.31%) of incisional hernia were treated with mesh repair, 18 cases (11.69%) with anatomical repair. According to meta-analysis performed by Holihan Julie et al. [18], Mesh repair was associated with significantly lesser rates of recurrence with absolute risk difference of mesh *vs.* suture repair being 12.6%.

The type of hernia and the operative procedure selected as the treatment modality showed a highly significant statistical difference in the present study. In case of incisional hernias, the commonly chosen treatment modality was the mesh procedure in this study. In a study by Vikram Kumar [19], of 48 patients who underwent mesh repair 5 developed recurrence whereas of the 21 whom underwent anatomical repair 6 developed recurrence, which was statistically significant (P<0.05) (Figure 6).

In terms of the complications encountered by the subjects of the present study, majority (86 out of 100) had no complications. However, of those who did have complications, the most common was infection which was seen among 14% of the participants. 8% had seroma and 5% each had ileus and dehiscence. In the year 2002, Van 'T Reit [20] found that 11 patients (14%) developed postoperative infections. In the study by Jaykar [13], seroma was seen in 2%, Wound Infection in 6%, recurrence in 4%. Celdrán et al. [21] noted wound infection and seroma collection in 5.5% of cases after incisional hernia repair. Infection did not lead to polypropylene mesh removal but was a risk factor for recurrence. Therefore, giving broad spectrum antibiotics at the induction of anesthesia is recommended.

The recurrence rate in the present study was noted to be only 3%. In the study by Jaykar et al. [13], recurrence was seen in 4% of patient, which is in line with the current study.

Conclusion

Ventral hernia tends to present mainly in the 40- to 60-year age with male to female ratio tends to be 2:1. Para-umbilical with umbilical hernia were most common types followed by incisional hernia. Swelling and pain were the major presenting symptoms. Risk factors like diabetes, smoking, poor nutritional status play a vital role in both development of ventral hernias as well as postoperative poor wound healing. Mesh repair was being more frequently used, compared to primary suture repair, to prevent recurrences as per the latest guidelines. Recurrence after hernia surgery is still a possibility with most occurring within a period of one year.

References

1. Fitzgibbons RJ Jr, Forse RA: Clinical practice. Groin hernias in adults. N Engl J Med. 2015;372:756-63.
2. Lassandro F, Iasiello F, Pizza NL, Valente T, Stefano ML, Grassi R, et al. Abdominal hernias: Radiological features. World J Gastrointest Endosc. 2011, 3:110-7.
3. Burger JW, Lange JF, Halm JA, Kleinrensink GJ, Jeekel H. Incisional hernia: Early complication of abdominal surgery. World J Surg. 2005;29:1608-13.
4. Le Huu Nho R, Mege D, Ouaïssi M, Sielezneff I, Sastre B. Incidence and prevention of ventral incisional hernia. J Visc Surg. 2012;149:e3-14.
5. Chandrakumar PC, Chitralekha, Vishwajith K, Sreeharsha SV. A study of ventral hernias in a tertiary care hospital: A case series study. Eur J Mol Clin Med. 2022;9(3):11935-9.
6. Ellis H, Gajraj H, George CD. Incisional hernias: When do they occur? J Br Surg. 1983;70(5):290-1.
7. Basta MN, Kozak GM, Broach RB, Messa CA 4th, Rhemtulla I, DeMatteo RP, et al. Can we predict incisional hernia? Development of a surgery-specific decision-support interface. Ann Surg. 2019;270(3):544-53.
8. Hari Krishnan KN. Age incidence Indian journal of surgery 1991 Incisional problem and care. J Am Coll Surg. 1998.
9. Chavan SS, Baruah DT, Ganesh Babu CP. A clinical study on ventral hernias in a tertiary care Hospital. Int Surg J. 2017;4(8):2600-4.
10. Vaz NC, Ferreira A, Kulkarni M, Vaz FS, Pinto N. Prevalence of diabetic complications in rural goa, India. Indian J Community Med. 2011;36(4):283-6.
11. Global Adult Tobacco Survey, Fact Sheet 2009-2010.
12. Bhaskaran A, Singh J, Basvarajappa M, Kodliwadmath H. Management of incisional hernia by preperitoneal mesh repair: A prospective study in rural population. J Clin Biomed Sci. 2011;1(3):106-22.
13. Jaykar R, Varudkar A, Akamanchi A. A clinical study of ventral hernia. Int Surg J. 2017;4(10)2349-902.
14. Shah PP, Shaikh S, Sunil P. Prevalence of anterior abdominal wall hernia and its associated risk factors. IJARS. 2016;5(3):7-10.
15. Höer J, Lawong G, Klinge U, Schumpelick V. [Factors influencing the development of incisional hernia. A retrospective study of 2,983 laparotomy patients over a period of 10 years]. Chirurg. 2002;73(5):474-80.
16. Mudge M, Hughes LE. Incisional hernia: A 10 year prospective study of incidence and attitudes. Br J Surg. 1985;72(1):70-1.
17. Lindmark M, Strigård K, Löwenmark T, Dahlstrand U, Gunnarsson U. Risk factors for surgical complications in ventral hernia repair. World J Surg. 2018;42(11):3528-36.
18. Holihan JL, Hannon C, Goodenough C, Flores-Gonzalez JR, Itani KM, Olavarria O, et al. Ventral hernia repair: A meta-analysis of randomized controlled trials. Surg Infect (Larchmt). 2017;18(6):647-58.

19. Kumar V, Rodrigues G, Ravi C, Kumar S. A comparative analysis on various techniques of incisional hernia repair-experience from a tertiary care teaching hospital in South India. Indian J Surg. 2013;75(4):271-3.

20. Van't RM, Vrijland WW, Lange JF, Hop WCJ, Jeekel J, Bonjer HJ. Mesh repair of incisional hernia: Comparison of laparoscopic and open repair. Eur J Surg. 2002;168(12):684-9.

21. Celdrán A, Frieyro O, Juan C, Souto JL, Esteban J, Rubio JM, et al. The role of antibiotic prophylaxis on wound infection after mesh hernia repair under local anesthesia on an ambulatory basis. Hernia. 2004;8(1):20-2.