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A prospective study evaluating the clinico-demographic profile and assessing outcome outcomes of ventral wall hernia repair in tertiary care hospital

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Abstract

Aim: The aim of this study was to shed the light on the most common predictive factors for the occurrence and rate of complications associated with hernia repair.

Material and Methods: A prospective study with total 200 patients were included, conducted at Department of General Surgery. After approval by the Institutional Ethics Committee, the study was conducted for the period of one year.

Results: 140 patients were females and 60 males in the present study. The mean age of patients was 36.4 with the oldest patient in our study being 90 years. The mean BMI for the studied population was 32.8. The mean duration of hospital stay was 3.5 days. Previous abdominal wall surgery was the most common risk factor (110 patients) followed by pregnancy (70 patients), chronic constipation (30 patients), chronic cough (10 patients). There was a significant correlation between age of patients and duration of admission (p value 0.003) however no significant correlation between gender and duration of admission was found. Para umbilical hernias were the most common operated hernia in our study (70 hernia) followed by umbilical (60 hernia), incisional (44 hernia). Type of hernia did not have a significant effect on outcome or duration of hospital stay, nor on the risk of recurring emergency surgery. Most common complication was seroma/hematoma developing in 20 of patients and 8 patients had a recurrence within the follow up period.

Conclusion: In conclusion; this was a single centre experience with the ventral hernia repair, addressing risk factors and educate the population is an important step that should be taken to decrease the incidence of ventral all hernia and its complication.

Keywords: Complication, recurrence, risk factors, ventral hernia

Introduction

Ventral abdominal wall hernias are one of the most common presenting surgical cases with approximately 2% of men developing them [1]. Around twenty million surgical repair of ventral abdominal wall hernias are done every year worldwide. The 5 most common abdominal hernias are as following: inguinal, umbilical, epigastric, incisional and para-umbilical [1]. Although ventral abdominal wall hernias are operated very frequently we still lack a grade A evidence that standardize the surgical repair of abdominal wall hernias. Currently most repairs are done using a mesh either in an onlay or sublay method, even though mesh free repair are still being used and this is completely dependent on the surgeon preference and in case of contamination or bowel resection [2]. When a mesh is used during the surgery, the risk of recurrence is less compared to the tissue repair. However, it was found that the rate of recurrence is also affected by the technique of surgical repairs [3].

Microscopic tissue tears secondary to repetitive stresses are responsible for the pathogenesis of ventral hernia. The main factors responsible for it are chronic cough, urinary straining, constipation, pregnancy, and obesity amongst many others [4]. The underlay technique, where a mesh is placed between the abdominal muscles and the posterior rectus sheath, followed by anterior fascia closure, is associated with less complications compared to inlay and onlay techniques [5]. Previous Studies showed that the laparoscopic approach during hernia repair is associated with less complications in terms of recurrence, surgical site complications including seromas, hematomas and wound healing disturbances, and length of hospital stay [5, 7]. The incidence rate of primary ventral hernias in Oman was found to be 56% and more common in younger females [6]. Several factors were found to increase the risk of incisional hernias including age, obesity, diabetes, smoking, infection and immunotherapy.

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The associated morbidity rate with complex incisional hernias reaches up to 30% necessitating their surgical repair [7].

So, the aim of this study was to shed the light on the most common predictive factors for the occurrence and rate of complications associated with hernia repair.

Materials and Methods

A prospective study with total 200 patients was included, conducted at Department of General Surgery. After approval by the Institutional Ethics Committee, the study was conducted for the period of one year.

Inclusion Criteria

Patients (>18 years of age) who presented with ventral hernias and were operated on electively in our hospital were included after obtaining written consent.

Exclusion Criteria

1. Patients who presented to acute surgical care unit in view of surgical emergencies like acute intestinal obstruction,
2. Lumbar hernias, and
3. Mentally disabled patients.

For the proper record, a proforma is prepared for the study. All patients involved in the study underwent a detailed clinical examination and a detailed history according to the designed proforma. The demographic data of the patient, risk factors, comorbidities, previous surgical history, investigations, type, and size of the hernia, defect size, and the content of the hernia was collected preoperatively. All patients were explained about surgical options available.

Patients then underwent surgery by laparoscopic or open technique. Intraoperative data such as findings, the procedure performed, drain placement, complications, and need for conversion, were also noted. Postoperative data such as pain on day 1 and on discharge, wound complications, other systemic complications, drain removal day, postoperative ICU care requirement, postoperative hospital stay, and condition at discharge was also collected for each patient. Postoperative pain is a significant factor affecting the immediate quality of life after ventral hernia repair. For postoperative pain score measurement, used the visual analog scale (VAS). The patient was asked to quantify the pain on a scale of 1 to 10. The more the number, the more severe is the pain. Three serial VAS scores at the intervals of 12 hours each was taken & the average pain score was calculated. Collected data on multiple parameters, including type of repair, size of hernia, number of hernia defects, patient comorbidities, patient BMI, number of prior surgeries, recurrence and complication.

Data sampling and collection

A prior power analysis was used to determine the sample size. Data was collected from the Hospital information system (track care). All patients had standardized data collection including demographic (age, gender, weight, height), patients risk factors, presentation (swelling, pain, incarcerating, obstruction or strangulation), type of hernia identified, recurrent or primary hernia, technique of surgical management, complications, period of hospital stay and follow ups. The primary outcome measure was the recurrence rate, the progression of overall recurrence rates with the follow-up duration & compared the laparoscopic and open techniques for changing recurrence rates as the follow-up duration increased.

Data analysis

Data were analysed by SPSS software version 25. The database for the study sample was created. The means and standard deviation (SD) of each of the above parameters were calculated. Frequency and column charts tables had been used to display continuous variables and categorized variables. To test the significance of the association between the categorized variables Chi-square test, ANOVA test was used and a p value of 0.05 or less taken as significant with a confidence interval of 95%.

Results

Table 1: Patient's clinico-demographic data

Characteristics		N (%)
Gender	Male	60 (30)
	Female	140 (70)
Age (years)	18-50	120 (60)
	51-60	46 (23)
	61-70	30 (15)
	Older than 70	4 (2)
Risk factor	Chronic cough	10 (5)
	Chronic constipation	30 (15)
	Pregnancies	70 (35)
	Previous abdominal surgery	110 (55)
	Heavy lifting	8 (4)

140 patients were females and 60 males in the present study. The mean age of patients was 36.4 with the oldest patient in our study being 90 years. The mean BMI for the studied population was 32.8. The mean duration of hospital stay was 3.5 days. Previous abdominal wall surgery was the most common risk factor (110 patients) followed by pregnancy (70 patients), chronic constipation (30 patients), chronic cough (10 patients). There was a significant correlation between age of patients and duration of admission (p value 0.003) however no significant correlation between gender and duration of admission was found.

Table 2: Number of cases based on the type of hernia

Type of hernia	N%
Umbilical	60 (30)
Paraumbilical	70 (35)
Incisional	44 (22)
Supraumbilical	16 (8)
Epigastric	8 (4)
Spegelian	2 (1)

Para umbilical hernias were the most common operated hernia in our study (70 hernia) followed by umbilical (60 hernia), incisional (44 hernia). Type of hernia did not have a significant effect on outcome or duration of hospital stay, nor on the risk of recurring emergency surgery.

Table 3: Frequency of post-operative complications for the participants

Post-operative complications	N%
Seroma/ Hematoma	20 (10)
Superficial infection	10 (5)
Recurrence of injury	8 (4)
Bowel injury	5 (2)
Deep infection	2 (1)
Chronic infection	2 (1)
Bowel obstruction	1 (0.5)

Most common complication was seroma/hematoma developing in 20 of patients and 8 patients had a recurrence within the follow up period.

Discussion

Ventral hernias are one of the most common problems confronting general surgeons. The rate of ventral incisional hernia in the long term after laparotomy has been reported to be as high as 20% to 25%. Multiple studies have suggested that laparoscopic repair of ventral hernias carries a lower recurrence rate and shorter hospital stay with quicker recovery^[8-11]. The 5 most common abdominal hernias are as following: inguinal, umbilical, epigastric, incisional and para-umbilical^[12]. Although ventral abdominal wall hernias are operated very frequently we still lack a grade A evidence that standardize the surgical repair of abdominal wall hernias. Currently most repairs are done using a mesh either in an onlay or sublay method, even though mesh free repair are still being used and this is completely dependent on the surgeon preference and in case of contamination or bowel resection^[7].

140 patients were females and 60 males in the present study. The mean age of patients was 36.4 with the oldest patient in our study being 90 years. The mean BMI for the studied population was 32.8. The mean duration of hospital stay was 3.5 days. Previous abdominal wall surgery was the most common risk factor (110 patients) followed by pregnancy (70 patients), chronic constipation (30 patients), chronic cough (10 patients). There was a significant correlation between age of patients and duration of admission (p value 0.003) however no significant correlation between gender and duration of admission was found. The mean age of our patients was 36.4 years old which is significantly different than what was reported in international studies 53.3 years yet it was comparable with a study that was conducted in Egypt 44.8 years old^[6, 13] Nevertheless, the analysis showed that the mean BMI of our study 32.8 kg/m² and hospital stay post operatively which was 3.5 days was approximately similar to the reported data internationally 27 kg/m² and a hospital stay of 3 days^[13, 14]. Also, the analysis of the included patients showed that there was significant correlation between age of patients and duration of admission, the younger the patient, the less hospital stay.

Para umbilical hernias were the most common operated hernia in our study (70 hernia) followed by umbilical (60 hernia), incisional (44 hernia). Type of hernia did not have a significant effect on outcome or duration of hospital stay, nor on the risk of recurring emergency surgery. However, it was found in a previous study that was done in the United Kingdom that the umbilical hernia was the commonest followed epigastric, and incisional hernias^[15]. Thus, was consistent with regional report which concluded para umbilical hernia as the most common^[12, 16]. In addition, there was no statistically significant correlation between the type of hernia and duration of hospital stay, nor outcomes.

Most common complication was seroma/hematoma developing in 20 of patients and 8 patients had a recurrence within the follow up period. Nicolau AE *et al*, found the most common complication post operatively was seroma in line with these findings a study of 1029 patients found that the most common early post-operative complication was also seroma.⁶ Nevertheless a meta-analysis showed that men had lower risk of recurrence which is inconsistent to our assumptions. They also concluded that there is significant relation between the type of surgery and recurrence rate, which is consistent to the

results in this study. Moreover, there was insignificant association between the use of mesh and recurrence rate which is conflicting with previous international study which showed a significant association between the use of mesh and recurrence rate, and that might be due to the difference in sample size of both studies^[17].

Conclusion

As a result, addressing risk factors and educating the populace is a crucial step that should be addressed to reduce the prevalence of ventral hernia and associated complications. This was a single centre experience with ventral hernia repair. A big multicentric research will be taken into consideration for better analysis and outcomes because the sample size was modest.

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