

Original Research Article

Demographics and outcomes of ventral wall hernia repair at Sultan Qaboos University Hospital

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ABSTRACT

Background: Ventral abdominal wall hernias are one of the most common encountered surgical cases. Currently most repairs are done using a mesh either in an onlay or sublay method. The high burden of ventral abdominal wall hernias, there is a need to determine the most common predictive factors for their occurrence and the complications associated with their repair so that the best preventive measures can be taken.

Methods: A retrospective cohort study was conducted at Sultan Qaboos University Hospital during the period between 1st January 2014 to 30 June 2019. All patients underwent ventral hernia repair were included and pediatric patients were excluded.

Results: The total number of included patients were 383. Previous abdominal wall surgery was the most common risk factor (218 of the patient) followed by pregnancy (132). 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 percentage of recurrence in open surgery was 4.69% and 12.50% in laparoscopic repair. There was insignificant correlation between the use of mesh and recurrence rate. It was reported that 73 patients developed post operative complication with higher rate for seroma and hematoma.

Conclusions: Addressing risk factors and educate the population is an important step that should be taken to decrease the incidence hernia and its complication. As the sample size was small and majority of patient are from one region, a large multicentre study will be considered for better analysis and results.

Keywords: Complication, Oman, 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.¹

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.² 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.³ However, it was found that the rate of recurrence is also affected by the technique of surgical repairs.³

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.⁴

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.^{2,4}

The incidence rate of primary ventral hernias in Oman was found to be 56% and more common in younger females.⁵ Several factors were found to increase the risk of incisional hernias including age, obesity, diabetes, smoking, infection and immunotherapy.² The associated morbidity rate with complex incisional hernias reaches up to 30% necessitating their surgical repair.²

The high burden of ventral abdominal wall hernias and their surgical repair related complications negotiates a need to determine the most common predictive factors for their occurrence and the complications associated with their repair so that the best preventive measures can be taken. 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 at Sultan Qaboos University Hospital.

METHODS

Study design

A retrospective cohort study was conducted at Sultan Qaboos University Hospital during the period between 1st January 2014 to 30 June 2019. The present study was approved by the Ethics Committee of the College of medicine and health sciences at Sultan Qaboos University.

Inclusion and exclusion criteria

All patient underwent ventral hernia repair at Sultan Qaboos University Hospital during the period between 1st January 2014 to 30 June 2019 were included in the study. Also all types of ventral hernia were included. Patient with age less than 13 years were excluded.

Data sampling and collection

A priori 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.

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

The total number of included patients were 383. Among those, 295 patients were females with female to male ratio is (3.3:1). The mean age of patients was 36.8 with the oldest patient in our study being 93 years. The mean BMI for the studied population was 32.3. the mean duration of hospital stay being 3.5 days.

Table 1: Patient's clinicodemographic data.

Characteristics		Number of patients
Gender	Male	88
	Female	295
Age (years)	18-50	242
	51-60	80
	61-70	43
	Older than 70	18
Risk factor	Chronic cough	22
	Chronic constipation	50
	pregnancies	132
	Previous abdominal surgery	218
	Heavy lifting	17

75% of patients had at least one known risk factor for developing abdominal wall hernia. Previous abdominal wall surgery was the most common risk factor (218 of the patient) followed by pregnancy (132 patient), chronic constipation (50 patient), chronic cough (22 patient). 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 (144 hernia) followed by umbilical (110 hernia), incisional (87 hernia) (Figure 1). Type of hernia did not have a significant effect on outcome or duration of hospital stay, nor on the risk of recurring emergency surgery.

Sixty patients had a laparoscopic hernia repair while 332 had an open repair. Open hernia repair was associated with a shorter hospital stay (p value 0.013). A mesh was used in 239 of the cases and a 152 had no mesh. When a

mesh was used the most common method was mesh overlay followed by underly 138, 61 respectively.

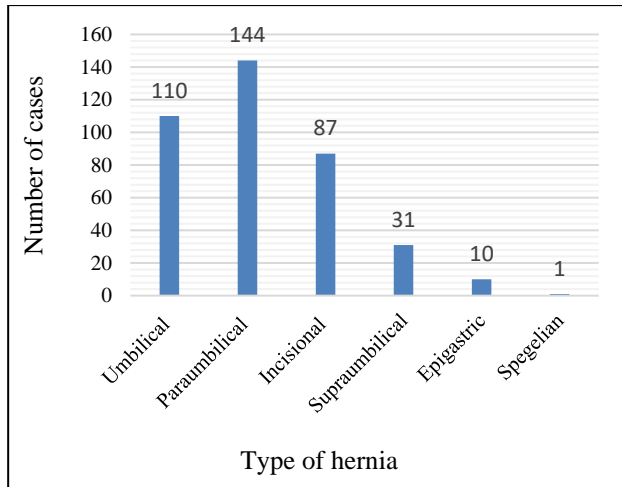


Figure 1: Number of cases based on the type of hernia.

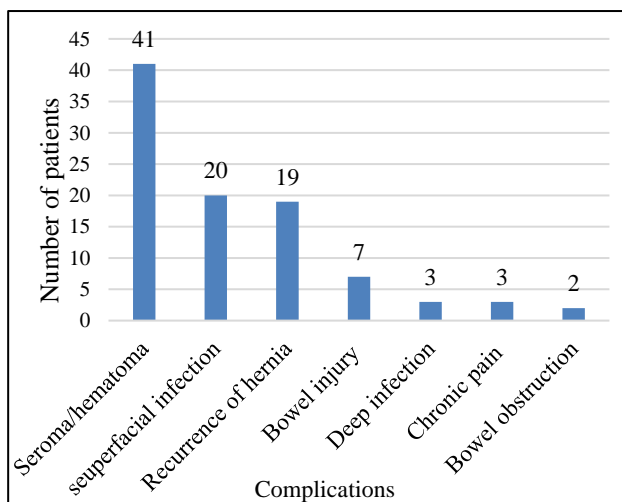


Figure 2: frequency of post-operative complications for the participants.

The percentage of recurrence in open surgery was 4.69% and 12.50% in laparoscopic repair. There was insignificant correlation between the use of mesh and recurrence rate. It was reported that 73 patients developed post-operative complication. Of those the most common complication was seroma/hematoma developing in 41 of patients and 19 patients had a recurrence within the follow up period (Figure 2).

DISCUSSION

Ventral abdominal hernia repair represents one of the most common performed surgeries and with recurrence rate of these hernias they represent a great lode on the health system. This study intended to identify factors predicting the occurrence and complications of ventral hernia repair. The mean age of our patients was 36.8

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.^{6,7} The female to male gender occurrence ratio was 3.3:1 in the presented study which is higher than ratios reported in other international studies 1.3:1.⁶ However, previous data from studies done in Egypt (5:1) are comparable to ours.⁸ This might correlate to the variation of environmental and genetic factors in Arab population when compared to western community. Nevertheless, the analysis showed that the mean BMI of our study 32.3 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.^{7,9}

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.

In agreement with international study, abdominal wall surgery was the most associated risk factor in the development of ventral hernia and this is elaborated more in an 11-years follow up study that was conducted in the United States of America composed of 420 patients found that abdominal wall surgery was the most common risk factor for the development of hernia.⁷ In the present study, para umbilical hernias were the most common operated hernia (144 hernia) followed by umbilical (110 hernia), and incisional (87 hernia). 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.⁸ Thus, was consistent with regional report which concluded para umbilical hernia as the most common.^{1,10} In addition, there was no statistically significant correlation between the type of hernia and duration of hospital stay, nor outcomes.

Surprisingly, the analysis showed that open hernia repair was associated with significantly shorter hospital stay which contraindicate with international literature where the laparoscopic repair is associated with less hospital stay.¹¹ The most common method of mesh application in for included participants was overlay followed by underly and that might be due to shorter operation time as it was mentioned in previous studies.⁹ 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

Finally, we demonstrated that most patients presented with abdominal swelling as the initial presentation which is consistent with a study that was conducted in Egypt.¹ Nevertheless, a meta-analysis showed that men had lower risk of recurrence which is inconsistent to our assumptions.¹² 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.¹²

As this is a retrospective study, a number of limitations were encountered including missing data, also some patient missed their follow up appointment, and relatively small sample size.

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. As the sample size was small and majority of patient are from one region, a large multicentre study will be considered for better analysis and results.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of the College of medicine and health sciences at Sultan Qaboos University

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