Original Article

Frequency of Early Complication in Mesh Repair of Paraumbilical Hernia

Complication in Mesh Repair of Hernia

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ABSTRACT

Objective: The objective of this study was to determine the frequency of early complications in mesh repair of paraumbilical hernia.

Study Design: Descriptive case series study.

Place and Duration of Study: This study was conducted at the Combined Military Hospital, Muzaffarabad from January 2019 to December 2019.

Materials and Methods: This study involved 170 patients of both genders aged between 20-50 years undergoing mesh repair of paraumbilical hernia. These patients were followed in the post-operative period to look for early complications; wound infection, seroma and hematoma formation. A written informed consent was taken from every patient. Statistical analysis has been done by SPSS 20.0. Mean±SD has been calculated for age and BMI while frequency and percentage has been calculated for gender, wound infection, seroma and hematoma formation. Data has been stratified for age, gender and BMI to address effect modifiers. Post-stratification chi-square test has been applied taking p-value ≤0.05 as statistically significant.

Results: The age of the patients ranged from 20 years to 50 years with a mean of 42.1±6.9 years. Majority (n=147, 86.5%) of the patients were aged between 36-50 years. There were 34 (20.0%) male and 136 (80.0%) female patients with a male to female ratio of 1:4. BMI of these patients ranged from 24.0 Kg/m^2 to 34.8 Kg/m^2 with a mean of 30.3±2.8 Kg/m^2. Among the various complications, wound infection was the most frequent and was observed in 15 (8.8%) patients followed by seroma (n=12, 7.1%) and hematoma (n=6, 3.5%) formation. When stratified, there was no significant difference in the frequency of wound infection, seroma and hematoma formation across various subgroups based on patient's age, gender and BMI.

Conclusion: Wound infection and seroma formation were observed in a substantial proportion of patients undergoing mesh repair of paraumbilical hernia which warrant meticulous surgical dissection and appropriate antibiotic prophylaxis in such patients to decrease the likelihood of these complications as well as watchful follow-up to timely identify and treat these complications when they occur.

Key Words: Paraumbilical Hernia, Mesh Repair, Complications

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INTRODUCTION

Hernia is a presentation of a viscous or part of a viscous through the walls of the cavity in which it normally resides[1].Umbilical hernia is relatively common in adults, and account for 3%-8.5% of abdominal hernias, third in incidence after inguinal (70%- 75%) and femoral (5% - 17%) hernias[1].

Conditions that lead to increased intra-abdominal pressure such as obesity, Ascites, multiple pregnancies, and large abdominal tumors, contribute to the development of umbilical hernias. Complications such as irreducibility, obstruction, strangulation, skin ulceration, and visual rupture are more common in paraumbilical hernias than in other abdominal hernias[2].

Potential complications of umbilical hernia repair include seroma, hematoma, wound infection, bowel injury, paralytic ileus, and hernia recurrence. Out of these complications infection needs to be cared for most. Therefore, every measure should be taken to reduce the incidence of infection after mesh repair [3-5].

A nationwide prospective study of umbilical and epigastric hernias demonstrated that complications requiring readmission included hematoma (46% of cases), seroma (19%), and pain readmission rate was (5%) and infection rate was (19%) [4].

In another randomized control trial complication like wound infection was in cases (11.11%) in GROUP A and in 2 cases (6.2%) in GROUP B, which were treated conservatively. Hematoma and seroma was higher in GROUP A (5.5%-2.7%) and lower in GROUP B (0.00%-3.1%)[6].

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My rationale is to highlight main early complications, as less no of studies are available in our area; it will help us in early diagnosis and prompt treatment. With such approach we can prevent the wound infection which causes recurrence and bad scarring of the wound. Based on prevalence of complications, one can adopt measures which can reduce these morbidities among our population.

MATERIALS AND METHODS

It's a descriptive case series. This research was conducted at Department of Surgery, Combined Military Hospital Muzaffarabad.Total 170 patients were selected by Non-Probability, Consecutive Sampling.Patients of age 20 to 50 years were included in study (because patients having age >50 are associated with different comorbidities). Patients admitted through emergency were excluded as they usually present with obstructed or strangulated hernia. Patients with co morbid condition like diabetes were also excluded. Patients were selected through outpatient department (OPD) after taking informed written consent. Personal bio data was taken on predesigned proforma. Hernia was examined for any sign of inflammation or infection. After admission patient were tested for routine investigations. All surgery was done by consultant surgeons having enough experience in open mesh, repair of paraumbilical hernia. In this procedure hernia sac was removed. Mesh was place beneath the hernia site. The mesh was attached using sutures sewn into the stronger tissue surrounding the hernia. Polypropylene mesh and sutures were used. The mesh was extended 3 to 4cm beyond the edges of the hernia. The umbilicus was fixed back to the muscle.

All patients after recovery were kept under close observation for three days for screening of complications like seroma and hematoma, and follow up was done on 7^{th} post-operative day after discharge for surgical wound infection. Seroma and hematoma develops within 3days and wound infection occurs at 5^{th} to 7^{th} post-operative day, according to operational definitions. Statistical analysis has been done by SPSS 20.0. Mean±SD has been calculated for age and BMI while frequency and percentage has been calculated for gender, wound infection, seroma and hematoma formation. Data has been stratified for age, gender and BMI to address effect modifiers. Post-stratification chi-square test has been applied taking p-value ≤0.05 as statistically significant.

RESULTS

The age of the patients ranged from 20 years to 50 years with a mean of 42.1±6.9 years. Majority (n=147, 86.5%) of the patients were aged between 36-50 years. There were 34 (20.0%) male and 136 (80.0%) female patients with a male to female ratio of 1:4. BMI of these patients ranged from 24.0 Kg/m^2 to 34.8 Kg/m^2 with a mean of 30.3±2.8 Kg/m^2 as shown in Table 8.1.

Among the various complications, wound infection was the most frequent and was observed in 15 (8.8%) patients followed by seroma (n=12, 7.1%) and hematoma (n=6, 3.5%) formation as shown in Table 8.2.

When stratified, there was no significant difference in the frequency of wound infection, seroma and hematoma formation across various subgroups based on patient's age, gender and BMI. Of the total 170 patients, 23 were in age group 20-25yrs, among these only 2% got wound infection and 137 patients were in age group 36-50yrs, among these 137 patients, 13(8.8%) got infection. Which shows no significant effect of age on wound infection?6 patients having BMI between 25-30kg/m^2, and out of these 6 pt no one got wound infection, 71 patients having BMI between 25-30 $kg/m^2$and out of these 6(8.5%) got infection, 93 patients had BMI between 30-35 kg/m^2 out of which 9(9.7%) got wound infection.

Regarding seroma, 1(4.3%) pt in age group 20-35yrs got post-operative seroma and 11(7.5%) pts in age group 36-50yrs got seroma. 2(5.9%) males and 10(7.9%) females got seroma. On basis of BMI, no pt of BMI between 20-25 kg/m^2got seroma, where-as 3(4.2%) and 9(9.7%) of patient with BMI 25-30 kg/m^2 and 30-35 kg/m^2 respectively got seroma.

Regarding hematoma, 1(4.3%) pt in age group 20-35yrs got post-operative seroma and 5(3.4%) pts in age group 36-50yrs got seroma. 1(2.9%) males and 5(3.7%) females got hematoma. On basis of BMI, no pt of BMI between 20-25 kg/m^2 got hematoma, whereas 2(2.9%) and 4(4.3%) of patient with BMI 25-30 kg/m^2 and 30-35 kg/m^2 respectively got hematoma.

Table No.1: Baseline Characteristics of Study Participants

Characteristics	Participants n=170
Age (years)	42.1±6.9
• 20-35 years	23 (13.5%)
• 36-50 years	147 (86.5%)
Gender	
• Male	34 (20.0%)
• Female	136 (80.0%)
BMI (Kg/m^2)	30.3±2.8
• 20-25 Kg/m^2	6 (3.5%)
• 25-30 Kg/m^2	71 (41.8%)
• 30-35 Kg/m^2	93 (54.7%)

Table No.2: Frequency of Various Complications

Complications	Frequency (n)	%age
Wound Infection	15	8.8
Seroma	12	7.1
Hematoma	6	3.5

DISCUSSION

Hernia formation is a multifactorial process involving endogenous factors including age, gender, anatomic variations, inheritance and exogenous factors such as smoking, comorbidity, and surgical factors. Paraumbilical hernia is relatively common in adults, and account for 3%-8.5% of abdominal hernias[1]. Paraumbilical hernia repair is often culmination of a complex decision-making process by the surgeon. Defect size, location, patient comorbidities, the presence of contamination, acuity of the patient's presentation, necessity for an ostomy, and history of prior repairs with or without a prosthetic all weigh into the ultimate repair approach. Disappointingly, high recurrence rates of up to 54·5% have been reported with suture repair [3]. The use of mesh has proven to be beneficial in hernia repair, and mesh repair has therefore become the gold standard repair associated with low recurrence rates of up to 1% of large umbilical hernias [3–5].

However, there are studies which claim increased risk of complications particularly infection, hematoma and seroma formation with the use of mesh [7,8,9,10]. The existing evidence however contained conflicting results while there was limited local such published material which necessitated the present study as knowing the magnitude of these complications would enable better intra-operative and post-operative management thus improving the patient outcome.

The objective of this study was to determine the frequency of early complications in mesh repair of paraumbilical hernia.

In the present study, the mean age of the patients was 42.1±6.9 years. A similar mean age of 41.2±9.2 years has been reported by Kiani et al. (2014) among patients presenting with paraumbilical hernia at Holy Family hospital, Rawalpindi [11]. Malik et al. (2009) reported similar mean age of 41.0±19.1 years among such patients presenting at Liaquat University of Medical and Health Sciences, Jamshoro [5] while Aziz et al. reported it to be 40.0±9.6 years at Nishtar Hospital Multan [12]. A similar mean age of 41±9.1 years has been reported by Sarhan et al. (2016) among Egyptian such patients [13].

We observed that there were 34 (20.0%) male and 136 (80.0%) female patients with a male to female ratio of 1:4. A similar female predominance among such patients has been reported by Aziz et al. at Nishtar Hospital Multan [12] and Tunio et al. at Gambat Institute of Medical Sciences, Gambat [14] with male to female ratio of 1:4. Kiani et al. reported similar female predominance with male to female ratio of 1:3.4 at Holy Family Hospital, Rawalpindi [11].

In the present study, the BMI of patients ranged from 24.0 Kg/m^2 to 34.8 Kg/m^2 with a mean of 30.3±2.8 Kg/m^2. Our observation is in line with that of Berger et al. (2014) and Wormer et al. (2013) who reported similar mean BMI of 30.5±0.3 Kg/m^2 and 30.2±5.5 Kg/m^2 respectively in American such patients [15,16]. Kaufmann et al. (2018) reported it to be 28±4 Kg/m^2 in Netherlands [17].

Among the various complications, wound infection was the most frequent and was observed in 15 (8.8%) patients. A comparable frequency of wound infection has been reported by Khan et al. who reported that 12.5% of patients undergoing mesh repair of paraumbilical hernia acquired wound infection[18]. Habib et al. in 2017 (7.5%) and Abdel-Baki et al. in 2007 (9.5%) also reported comparable frequency of wound infection following mesh repair of paraumbilical hernia [19,20].

In the present study, seroma formation was observed in 7.1% patients. Afzal et al. in another local study, observed similar frequency of seroma formation after mesh repair of paraumbilical hernia and reported that 6.3% of patients developed seroma in the early post-operative period. Sarhan et al. in 2016 (6.0%) and Arroyo et al. in 2001 (6.0%) reported similar frequency of seroma formation after mesh repair of paraumbilical hernia [13,21].

We observed that 3.5% of patients undergoing mesh repair of paraumbilical hernia developed hematoma in the early post-operative period. Our observation is in line with that of Aziz et al. who reported similar frequency of 4.0% for post-operative hematoma formation among such patients at Nishtar Hospital, Multan [12]. Tunio et al. reported similar frequency of 4.3% at Gambat Institute of Medical Sciences, Gambat [80] while Malik et al. reported it to be 3.0% at Liaquat University of Medical and Health Sciences, Jamshoro [5]. Habib et al. reported similar frequency of 3.8% in Egyptian such patients [19].

The present stud has identified wound infection and seroma formation as potential frequent complications of mesh repair of paraumbilical hernia. It is therefore advisable that meticulous dissection should be adopted during the surgery and dead space should be appropriately obliterated to decrease the likelihood of seroma formation. The patient should receive appropriate antibiotic prophylaxis to decrease the risk of wound infection. The surgeon should also be vigilant in the post-operative period to timely identify these complications once they occur as timely identification and management can improve the patient outcome.

A very strong limitation to the present study was that we didn't consider the various methods of mesh repair like onlay, inlay or sublay techniques to see if there was any difference in the frequency of these complications among various placements of abdominal mesh. This could have further helped in the appropriate management planning of these patients. Such a study is highly recommended in future research.

CONCLUSION

Wound infection and seroma formation were observed in a substantial proportion of patients undergoing mesh repair of paraumbilical hernia which warrant meticulous surgical dissection and appropriate antibiotic prophylaxis in such patients to decrease the likelihood of these complications as well as watchful follow-up to timely identify and treat these complications when they occur.

Author's Contribution:

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