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**ORIGINAL ARTICLE**

# Comparison of the Outcomes of Laparoscopic Approach with Open Method for Primary Ventral Hernia Repair

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## ABSTRACT

**Aim:** To compare the outcomes of laparoscopic approach with open method in patients undergoing primary ventral hernia repair.

**Study Design:** Randomized control trial

**Place and Duration:** This study was conducted at Kuwait Teaching Hospital and Lady Reading Hospital Peshawar during the period of January 2017 to December 2019.

**Methods:** One hundred and ninety patients of both genders with ages ≥18 years were included. All the patients were divided in to two groups, i.e' Group A consists of 95 patients received open procedure and Group B with 95 patients received laparoscopic approach for primary ventral hernia repair. Outcomes in term of complications, hospital stay and recurrence rate were examined and compare the results between both groups. Data was analyzed by SPSS 23.0.

**Results:** There were 65 (68.4%) females and 30 (31.6%) males in Group A and in Group B 35 (36.8%) males and 60 (63.2%) females. Mean age of patients in Group A was 40.14±3.31 years and in Group B it was 42.94±8.55 years. In Group B hospital stay was shorter than Group A (3.11±1.20 days Vs 5.9±3.9 days). According to the wound infection we found significant difference between Group A and Group B (12.6% and 4.2%);[p-value <0.05]. In Group A 5.3% patients had developed wound dehiscence while in Group B none of patient found to have wound dehiscence (p-value <0.05). Recurrence rate was also high in Group A 7.4% vs 2.1% in Group B (p=<0.05).

**Conclusion:** It is concluded that laparoscopic repair of primary ventral hernia is safe and effective with lesser complications as compared to open method.

**Keywords:** Ventral Hernia, Laparoscopic, Open Procedure, Wound Infection, Wound Dehiscence, Recurrence.

## INTRODUCTION

Ventral hernia develops at the weakest point of fascial wall of the abdomen with resultant protrusion/evisceration of the intraabdominal/preperitoneal contents. [1,2]

Repair of these hernias is one of the most common operation carried out by general surgeons in the USA.[3]

The methods of ventral hernias documented in the early literature included simple suturing and primary closure. Thesemethods have evolved over time to include tension-free hernioplasty and component separation. LeBlanc &Booth[4] described the first laparoscopic repair for incisional hernia in 1993.

A number of studies comparing these two approaches have demonstrated that the laparoscopic procedure reduces post-operative pain and hospital stay, and allows for a quicker return to normal activities after surgery.[3-5] Though wound there are different opinions regarding wound infection and development of recurrent hernia,several authors document that hernia repair done laparoscopically is certainly beneficial. [5-7]

According to a recently carried out survey of surgeons in practice from different hospitals,>90% of respondents said they do not carry out hernia repair laparoscopicallyand 81% of them expressed their concerns of absence of better outcome, chances of iatrogenic injuries to the gut, duration of operation, expenditure and experience.[8]

Ventral hernioplasty is now widely performed laparoscopically after many years of advancements. Less surgical time, a shorter hospital stay, an improved patient result, and fewer complications may be associated with laparoscopic hernia repair [9].

The present study was conducted aimed to examine the safety and effectiveness of open repair and laparoscopic repair of primary ventral (umbilical, para-umbilical and epigastric)hernia and to compare the findings between both procedures.

## MATERIALS AND METHODS

This study was conducted at Kuwait Teaching Hospital and Lady Reading Hospital Peshawar during the period January 2017 to December 2019. In this study 190 patients of both genders with ages ≥18 years undergoing primary ventral (umbilical, para-umbilical and epigastric) hernia repair were included. Patients detailed demographic including age, sex and body mass index (BMI) was recorded after taking informed consent from all the patients. Patients with ages less than 18 years, emergency hernia repair patients, recurrent patients and patients with hernia size was too large were excluded from this study.

All the patients were divided in to two groups. Group A consist of 95 patients received open procedure (Onlay mesh repair) and Group B with 95 patients received

laparoscopic Intra-Peritoneal Onlay Mesh (IPOM) repair for primary ventral hernia. Both procedures were done under general anaesthesia by the same surgeon. Outcomes in term of hospital stay, wound infection, wound dehiscence and recurrence were examined and compared between both groups. Patients were followed for 12 months.

Data was analyzed by SPSS 23.0. Chi-square and student 't'test were applied to compare the findings between both groups. Frequency and percentages were recorded in tabulation form. P-value <0.05 was considered as significant.

## RESULTS

There were 65 (68.4%) females and males in Group A and in Group B 35 (36.8%) males and 60 (63.2%) females. Mean age of patients in Group A was 40.14±3.31 years and in Group B it was 42.94±8.55 years. In Group A 38 (40%) patients had BMI 25 to 30 kg/m$^2$ and 57 (60%) patients had BMI above 30 kg/m$^2$. In Group B 34 (35.8%) patients had BMI 25 to 30 kg/m$^2$ and 61 (64.2%) patients had BMI above 30 kg/m$^2$. (Table 1)

Table No 1. Baseline characteristics of all the patients

| Characteristics | group A | Group B | P-value |
|---|---|---|---|
| Mean Age (Yrs) | 40.14±3.31 | 42.94±8.55 | 0.03 |
| Gender | | | |
| Male | 30 (31.6%) | 35 (36.8%) | N/S |
| Female | 65 (68.4%) | 60 (63.2%) | N/S |
| BMI (kg/m) | | | |
| 25.5 to 30 | 38 (40%) | 34 (35.8%) | N/S |
| >30 | 57 (60%) | 61 (64.2%) | N/S |

In Group B hospital stay was shorter than Group A (3.11±1.20 days Vs 5.9±3.9 days). Mean operative time in group A was greater than group B(60.7 mins Vs 35.5mins) (table 2)

Table No 2. Comparison of outcomes between both groups

| Characteristics | Group A | Group B | P-value |
|---|---|---|---|
| Mean Operative Time (Min) | 60.7 | 35.5 | 0.001 |
| Mean Hospital Stay (Days | 4.4±1.5 | 2.45±0.60 | 0.003 |

According to the wound infection we found significant difference between Group A and Group B (12.6% and 4.2%);[p-value <0.05]. In Group A 5.3% patients had developed wound dehiscence while in Group B none of patient found to have wound dehiscence (p-value <0.05). Recurrence rate was also high in Group A 7.4% vs 2.1% in Group B (p=<0.05).

Table No 2. Comparison of complications between both groups

| Complication | group A | Group B | P-value |
|---|---|---|---|
| Wound Infection | | | |
| Yes | 12 (12.6%) | 4 (4.2%) | <0.05 |
| No | 83 (87.4%) | 91 (95.8%) | |
| Wound Dehiscence | | | |
| Yes | 5 (5.3%) | 0 (0) | <0.001 |
| No | 90 (94.7%) | 95 (100%) | |
| Recurrence | | | |
| Yes | 7 (7.4%) | 2 (2.1%) | <0.05 |
| No | 88 (92.6%) | 93 (97.9%) | |

## DISCUSSION

Ventral hernias are related with decreased day-to-day activities and substantial socioeconomic expenditures for their treatment. It has been shown that surgical failure has been minimized with the use of meshes. Before the introduction of prostheses, the recurrence rate was over 50% [10]. Introduction of laparoscopic repair as an alternative to open repair [11] is becoming more common. Both open and laparoscopic approaches had its own advantages and disadvantages but open method for ventral hernia repair reported high rate of complications as compared to laparoscopic approach [12]. The present study was conducted to examine the complications of open repair and laparoscopic repair of primary ventral hernia and to compare the findings between both groups to examine the safety and effectiveness of both procedures. In this regard total 190 patients were included. We divided all the patients in to two groups 95 patients in each group. Group A received open method and Group B received laparoscopic technique. There were 65 (68.4%) females and males in Group A and in Group B 35 (36.8%) males and 60 (63.2%) females. Mean age of patients in Group A was 40.14±3.31 years and in Group B it was 42.94±8.55 years. In Group A 38 (40%) patients had BMI 25 to 30 kg/m$^2$ and 57 (60%) patients had BMI above 30 kg/m$^2$. In Group B 34 (35.8%) patients had BMI 25 to 30 kg/m$^2$ and 61 (64.2%) patients had BMI above 30 kg/m$^2$. These results were comparable to different previous studies [13,14].

In present study we found that overall complications were high in patients whom received open method for ventral hernia repair as compared to patients whom received laparoscopic method 25.3% Vs 6.3%. These results were similar to many of previous studies in which laparoscopic procedure had very low rate of complications 4 to 10% as compared to open method 20 to 45% [15-16]. In this study we found that the mean operative time was shorter in Group B 35.5 min as compared to Group A 60.7 minutes (p-value <0.05). In Group B hospital stay was shorter than Group A (3.11±1.20 days Vs 5.9±3.9 days).According to Froylich (2016), laparoscopic surgery took 3.2 days, whereas open surgery took 3.8 days, and Olmi (2007), laparoscopic surgery took 2.7 days, while open surgery required 9.9 days of recovery time. There was also a study conducted by Misra (2006) that found that laparoscopic surgery takes 1.5 days and open surgery takes 3.4 days (p-value 0.005). [11,17,18]

In present study according to the wound infection we found significant difference between Group A and Group B (12.6% and 4.2%);[p-value <0.05]. In Group A 5.3% patients had developed wound dehiscence while in Group B none of patient found to have wound dehiscence (p-value <0.05). Recurrence rate was also high in Group A 7.4% Vs 2.1% in Group B (p=<0.05). These results were similar to many of other studies in which wound infection rate was high in open repair 15 to 25% as compared to laparoscopic repair 0-10% [19]. Some other studies demonstrated that laparoscopic approach had low risk of developing wound dehiscence as compared to open method [20]. There is a higher recurrence rate with primary repair even in defects of <4 cm [21]. Morbid obesity > 30 kg/m, diabetes and wound infection are independent risk factors for recurrence

[22]. Smoking also considered a risk for recurrence[23]. Moreover, uncontrolled ascites is associated with a significant risk of recurrence [24].

## CONCLUSION

We concluded that laparoscopic repair of primary ventral hernia is safe and effective with lesser complications as compared to open method. We found that hospital stay was longer in open repair as compared to laparoscopic repair. Wound infection and wound dehiscence rate was also high in open repair. Recurrence rate was significantly higher in open repair group as compared to laparoscopic approach.

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