**ORIGINAL ARTICLE**

# Examine the Outcomes of Open Method and Laparoscopic Approach for Paraumbilical Hernia Repair

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## ABSTRACT

**Aim:** To examine the outcomes of open method and laparoscopic procedure for the treatment of paraumbilical hernia and compare the findings between both techniques.
**Study Design:** Randomized control trial
**Place and Duration:** Department of General Surgery, Shalamar Hospital, Lahore from 1st January, 2019 to 30th June 2019.
**Methods:** Two hundred patients of both genders with ages above 20 years were included. All the patients were divided in to two groups i.e. Group A consist of 100 patients received open procedure and Group B with 100 patients received laparoscopic approach for para-umbilical hernia repair. Outcomes in term of complications, hospital stay and recurrence rate were examined and compare the results between both groups.
**Results:** There were 70% females and 30% males in Group A and in Group B 34% males and 66% females. Mean age of patients in Group A was 39.20±6.35 years and in Group B it was 41.15±5.40 years. In Group B hospital stay was shorter than Group A (2.45±0.60 days Vs 4.4±1.5 days). According to the wound infection we found significant difference between Group A and Group B (10% and 3%);[p-value <0.05]. In Group A 4% 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 8% vs 1% in Group B (p=<0.05).
**Conclusion:** Laparoscopic repair of paraumbilical hernia is safe and effective with lesser complications as compared to open method.
**Keywords:** Para-umbilical Hernia, Laparoscopic, Open Procedure, Wound Infection, Wound Dehiscence,

## INTRODUCTION

Umbilical hernia and paraumbilical hernia (PUH) are ventral hernia that occur in the region of the umbilicus or around the umbilicus.[1,2] Umbilical hernia accounts for 10% of abdominal hernia[3]. Umbilical hernia occurs in infants and children, while PUH occurs in adults. Umbilical hernia rarely occurs in adult patients with ascites, obesity, and massive abdominal distention from various causes. There are advantages to the management of umbilical hernia and PUH using meshes[3,4]

The different surgical methods employed in the repair of umbilical hernia and PUH are open anatomical repair, open mesh repair with different sites of mesh placement (onlay, sublay, and inlay), laparoscopic intraperitoneal onlay mesh repair (IPOM), and open IPOM. The recurrence rate (19% to 54%) is greater in anatomical suturing than in mesh repair[5–7]. The different sites of deployment of mesh have advantages and disadvantages.

There is a paucity of evidence to substantiate the preference of laparoscopic ventral hernia repair over open ventral hernia repair for primary ventral hernias. Numerous studies have compared the outcomes of patients who underwent laparoscopic ventral hernia repair with the outcomes of patients who underwent open ventral hernia repair; however, most of these studies have focused on incisional hernias or a mixed population of ventral hernia repairs.[8] The present study was conducted aimed to examine the safety and effectiveness of open repair and laparoscopic repair of para-umbilical hernia and to compare the findings between both procedures.

## MATERIALS AND METHODS

This study was conducted at Department of General Surgery, Shalamar Hospital, Lahore from 1st January, 2019 to 30th June 2019. A total of 200 patients of both genders with ages above 20 years undergoing paraumbilical hernia repair were included. Patients detailed demographic including age, sex and body mass index (BMI) was recorded. Patients with ages less than 20 years, emergency hernia repair patients, recurrent patients and patients with hernia size was too large were excluded. All the patients were divided in to two groups. Group A consist of 100 patients received open procedure and Group B with 100 patients received laparoscopic approach for para-umbilical hernia repair. Both procedures were done under general anesthesia. Outcomes in term of hospital stay, wound infection, wound dehiscence and recurrence were examine and compare the findings between both groups. Patients were followed for 6 months. Data was analyzed by SPSS 24. 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 70% females and 30% males in Group A and in Group B 34% males and 66% females. Mean age of patients in Group A was 39.20±6.35 years and in Group B it was 41.15±5.40 years. In Group A 35% patients had BMI 25 to 30 kg/m$^2$ and 65% patients had BMI above 30 kg/m$^2$.

In Group B 33% patients had BMI 25 to 30 kg/m$^2$ and 67% patients had BMI above 30 kg/m$^2$ (Table 1).

Mean operative time was shorter in Group B 38.5 min as compared to Group A 62.6 minutes (p-value <0.05). In Group B hospital stay was shorter than Group A (2.45±0.60 days Vs 4.4±1.5 days). According to the wound infection we found significant difference between Group A and Group B (10% and 3%);[p-value <0.05]. In Group A 4% 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 12% Vs 1% in Group B (p=<0.05) (Table 2).

Table 1: Demographic information of the patients

| Variable | Group A | Group B | P-value |
|---|---|---|---|
| Age (years) | 39.20±6.35 | 41.15±5.40 | 0.03 |
| **Gender** | | | |
| Male | 30 (30.0) | 33 (33.0) | N/S |
| Female | 70 (70.0) | 67 (67.0) | N/S |
| **BMI (kg/m$^2$)** | | | |
| 25.5 - 30 | 35 (35.0) | 33 (33.0) | N/S |
| >30 | 65 (65.0) | 67 (67.0) | N/S |

Table 2: Comparison of outcomes between both groups

| Outcome | Group A | Group B | P-value |
|---|---|---|---|
| Operative time (min) | 62.6 | 38.5 | 0.001 |
| Hospital stay (days) | 4.4±1.5 | 2.45±0.60 | 0.003 |
| **Wound infection** | | | |
| Yes | 10 (10%) | 3 (3%) | <0.05 |
| No | 90 (90%) | 98 (98%) | |
| **Recurrence** | | | |
| Yes | 12 (12%) | 1 (1%) | <0.05 |
| No | 88 (88%) | 99 (99%) | |

## DISCUSSION

Ventral hernia repair is one of the most commonly performing surgical treatment in all over the world. Different methods have been used for the surgical treatment of para-umbilical hernia but open method and laparoscopic repair are considered as the methods of choice.[9,10] Both open and laparoscopic approaches had its own advantages and disadvantages but open method for para-umbilical hernia repair reported high rate of complications as compared to laparoscopic approach[11]. The present study was conducted to examine the complications of open repair and laparoscopic repair of para-umbilical hernia and to compare the findings between both groups to examine the safety and effectiveness of both procedures. In this regard total 200 patients were included whom were undergoing para-umbilical hernia repair. We divided all the patients in to two groups 100 patients in each group. Group A received open method and Group B received laparoscopic technique. There were 70% females and 30% males in Group A and in Group B 34% males and 66% females. Mean age of patients in Group A was 39.20±6.35 years and in Group B it was 41.15±5.40 years. In Group A 35% patients had BMI 25 to 30 kg/m$^2$ and 65% patients had BMI above 30 kg/m$^2$. In Group B 33% patients had BMI 25 to 30 kg/m$^2$ and 67% patients had BMI above 30 kg/m$^2$. These results were comparable to different previous studies.[12,13]

In present study we found that overall complications were high in patients whom received open method for para-umbilical hernia repair as compared to patients whom received laparoscopic method 26% Vs 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%.[14,15] In this study we found that the mean operative time was shorter in Group B 38.5 min as compared to Group A 62.6 minutes (p-value <0.05). In Group B hospital stay was shorter than Group A (2.45±0.60 days Vs 4.4±1.5 days). A study by Appleby PW et al [16] reported that laparoscopic approach got shorter time as compared to open method (32.5 min, SD 57.5). However they reported that the mean length of stay was significantly longer after a laparoscopic repair compared to open repair (0.29 days, SD 0.68 vs. 0.17 days, SD 1.49). Another study by Nazir et al[17] in Pakistan regarding para-umbilical hernia repair demonstrated that hospital stay was longer in patients who received open method as compared to laparoscopic technique with p-value <0.005).

In present study according to the wound infection we found significant difference between Group A and Group B (10% and 3%);[p-value <0.05]. In Group A 4% 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 12% Vs 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%.[18,19] 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

Laparoscopic repair of paraumbilical 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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