

# Compare the Outcomes of Laparoscopic Versus Open Procedure for Paraumbilical Hernia Repair

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## ABSTRACT

**Objective:** To compare the outcomes in term of operative time, hospital stay, wound infection, wound dehiscence and recurrence of open versus laparoscopic procedure in patients undergoing paraumbilical hernia repair.

**Study Design:** Randomized controlled trial

**Place and Duration of Study:** Bacha Khan Medical Complex Swabi February 2019 to February 2020

**Methodology:** One hundred and eighty patients of both genders with ages 20 to 60 years undergoing paraumbilical hernia repair were included. All the patients were categorized into two equal groups. Each group contains 90 patients. Group I received open method while group II received laparoscopic method. Postoperative hospital stay, operative time, wound infection, wound dehiscence and recurrence were compared between both methods.

**Results:** One hundred and twenty four (68.89%) patients were female while 56 (31.11%) were male with mean age 40.46±10.72 years. Mean BMI was 25.26±2.48 kg/m<sup>2</sup>. In open method operative time was shorter than laparoscopic method 31.16±4.84 minutes ±s 40.56±8.74 minutes (p<0.05). Hospital stay was shorter in laparoscopic method than open method (p-value <0.05). Wound infection, wound dehiscence and recurrence rate was high in open method as compared to laparoscopic method with p-value <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, Recurrence

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## INTRODUCTION

Umbilical hernia and paraumbilical hernia (PUH) are ventral hernia in or near the umbilicus zone.<sup>1,2</sup> Umbilical hernia constitutes 10% of abdominal hernia.<sup>3</sup> In infants and adolescents, umbilical hernia occurs and in adults, PUH. In adults with ascites, obesity and massive abdominal condition from separate causes, umbilical hernia never happens. Nube hernia and PUH are handled using meshes with advantages.<sup>3,4</sup>

Open anatomic repair, open mesh repair at various mesh placement sites (onlay, replacement and inlay), laparoscopic intraperitoneal onlay mesh repair (IPOM), and open IPOMs are common surgical procedures used in the repair of the umbilical hernia and PUH. In anatomic sutures, the recurrence rate (19% to 54%) is higher than in mesh repairs.<sup>5-7</sup> The advantages and drawbacks of the various mesh deployment locations.

The choice of laparoscopic ventral hernia repair over open ventral hernia repair for primary ventral hernias is not supported by any evidence. Many studies have compared the findings of ventral hernia laparoscopy patients with findings for ventral hernia patients; however, the majority of the studies have concentrated on the incisional hernia or mixed ventral hernia repair population.<sup>8</sup> 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 Bacha Khan medical complex Swabi February 2019 to February 2020. A total of 180 patients of both genders with ages 20 to 60 years undergoing paraumbilical hernia repair were included. Patients detailed demographic including age, sex and body mass index (BMI) were recorded after taking informed written consent. 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 categorized into two equal groups. Each group contains 90 patients. Group I received open method while group II received laparoscopic method. Both procedures were done under general anaesthesia. Outcomes in term of operative time, hospital stay, wound infection, wound dehiscence and recurrence were examined 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. P-value <0.05 was considered as significant.

## RESULTS

There were 124 (68.89%) female patients while 56 (31.11%) male patients with mean age 40.46±10.72 years. Mean BMI was 25.26±2.48 kg/m<sup>2</sup> (Table 1). In open method operative time was shorter than laparoscopic method 31.16±4.84 minutes Vs 40.56±8.74 minutes

( $p < 0.05$ ). Hospital stay was shorter in laparoscopic method than open method ( $p$ -value  $< 0.05$ ) [Table 2]. According to the complications, wound infection, wound dehiscence and recurrence rate was high in open method as compared to laparoscopic method with  $p$ -value  $< 0.05$  (Table 3).

Table 1: Baseline details of all the patients

| Variable                 | No.         | %      |
|--------------------------|-------------|--------|
| Mean age (years)         | 40.46±10.72 |        |
| Gender                   |             |        |
| Male                     | 56          | 31.11% |
| Female                   | 124         | 68.89% |
| BMI (kg/m <sup>2</sup> ) | 25.26±2.48  |        |

Table 2: Comparison of Hospital stay and operative time between open and laparoscopic procedures

| Outcome                  | Open       | Laparoscopic | P-value   |
|--------------------------|------------|--------------|-----------|
| Operative time (minutes) | 40.56±8.74 | 31.16±4.84   | $< 0.001$ |
| Hospital stay (Days)     | 3.96±1.48  | 1.75±0.48    | 0.002     |

Table 3: Comparison of complications

| Complications    | Open       | Laparoscopic | P-value |
|------------------|------------|--------------|---------|
| Wound infection  | 12 (13.33) | 4 (4.44)     | 0.042   |
| Wound dehiscence | 3 (3.33)   | 0 (0)        | 0.02    |
| Recurrence       | 10 (11.11) | 2 (2.22)     | 0.038   |

## DISCUSSION

Ventral hernia repair is one of the most commonly performing surgical treatments 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.<sup>9,10</sup> 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.<sup>11</sup> 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 90 patients in each group. Group I received open method and Group II received laparoscopic technique. 124 (68.89%) patients were female while 56 (31.11%) were male with mean age 40.46±10.72 years. Mean BMI was 25.26±2.48 kg/m<sup>2</sup>. These results were comparable to different previous studies.<sup>12,13</sup>

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 28.89% Vs 6.67%. 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%.<sup>14,15</sup>

We found that in open method operative times was shorter than laparoscopic method 31.16±4.84 minutes Vs 40.56±8.74 minutes ( $p < 0.05$ ). A study by Appleby et al<sup>16</sup> reported that laparoscopic approach got shorter time as

compared to open method (32.5±57.5 min). Hospital stay was shorter in laparoscopic method than open method ( $p$ -value  $< 0.05$ ). Wound infection, wound dehiscence and recurrence rate was high in open method as compared to laparoscopic method with  $p$ -value  $< 0.05$ . Appleby et al<sup>16</sup> reported that the mean length of stay was significantly longer after a laparoscopic repair compared to open repair (0.29±0.68 vs. 0.17±1.49 days). Another study by Nazir et al<sup>17</sup> 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  $< 0.005$ . 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%.<sup>18,19</sup> Some other studies demonstrated that laparoscopic approach had low risk of developing wound dehiscence as compared to open method.<sup>20</sup> There is a higher recurrence rate with primary repair even in defects of  $< 4$  cm.<sup>21</sup> Morbid obesity  $> 30$  kg/m, diabetes and wound infection are independent risk factors for recurrence.<sup>22</sup> Smoking also considered a risk for recurrence.<sup>23</sup> Moreover, uncontrolled ascites is associated with a significant risk of recurrence.<sup>24</sup>

## 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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