

# Comparative Study between Open Repair and Laparoscopic Repair Incision Hernia.

Chandra Sekhar Chevuturu<sup>1</sup>

<sup>1</sup>Assistant Professor, Department of Surgery, Bhasker Medical College, Yenkapally, Moinabad.

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## ABSTRACT

**Background:** Incisional hernias mostly manifest after considerable delay following the initial surgery. The incidence of hernia development shows a linear curve. Thus, there is much more than the technique of wound closure that contributes to the formation of these hernias. **Methods:** Two comparative group were taken in this study. One was open repair group and another one laparoscopic repair group. In both study 76 cases were included. All cases were subjected under preoperative evaluation. **Results:** In this study found that open repair group 31.5% cases suffered from wound infection while in another group nobody were suffered from such type of wound infection. **Conclusion:** This study conclude that laparoscopic group patients can resume their work early. In comparison to open repair, laparoscopic approach has shown promising results and is being widely accepted.

**Keywords:** Hernia, Open repair group, laparoscopic group, Wound.

## INTRODUCTION

Incisional hernia is known as the occurrence of chronic wound dehiscence with the formation of a hernial sac and canal months to years after surgery.<sup>[1]</sup> Recently, incisional hernia is receiving greater attention worldwide. The main reasons are probably due to the increasing use of ultrasonography, long term survival even after oncological surgery, and demographic developments that permit longer follow up. Now incisional hernia is considered as a long-term consequence of abdominal surgery.<sup>[2]</sup> It occur through a weakness at the site of abdominal wall closure. For the repairment of incisional hernias several problems need to be overcome like a multilayered wall structure of different tissue properties in constant motion has to be sutured.<sup>[3]</sup> There are several risk factors which are responsible for recurrence. These factors are related to patient's status, underlying disease, surgical technique and postoperative complications etc. Surgical technique of wound closure also plays an important role. It has been reported that modified Smead Jones technique has been shown to decrease the incidence of early wound dehiscence.<sup>[4]</sup> In this technique interrupted closure of the abdominal wall using nonabsorbable suture material, with sutures taken in a 'far near-near

far' fashion. Perioperative factors appear to have the most significant correlation to incisional hernia. Wound infection being the most consistently reported risk factor. Deep abscesses, perioperative gastrointestinal complications and early reoperations are some other factors too.<sup>[5]</sup> Incisional hernias mostly manifest after considerable delay following the initial surgery. The incidence of hernia development shows a linear curve. Thus, there is much more than the technique of wound closure that contributes to the formation of these hernias. For example, an aortic aneurysm or a proven defect of collagen synthesis patients presents an increased incidence of incisional hernias and thus require more extensive reinforcement.<sup>[6]</sup>

## MATERIALS AND METHODS

### Study Area

This case comparative study were conducted in the department of surgery in a tertiary care centre.

### Study Population

Two comparative group were taken in this study. One was open repair group and another one laparoscopic repair group. In both study 76 cases were included.

### Study Duration

The duration of study was from August 2017 to February 2018.

### Data Collection

All the patients were evaluated by proper history, detailed physical examination and underwent

### Name & Address of Corresponding Author

Dr. Chandra Sekhar Chevuturu  
Assistant Professor,  
Department of Surgery,  
Bhasker Medical College,  
Yenkapally, Moinabad.

relevant hematology, biochemistry investigations. Ultrasound of abdomen was performed for all the patients to know the size of the defect, number of defects, contents and to detect other abdominal pathology if any. All the patients were operated under general anaesthesia. Nasogastric tube and Foleys catheter in urinary bladder were placed in all cases. During post-operative period all patients were given parenteral antibiotics and analgesic once in 12 hours on first day and there after orally. The pain experienced by the patients in the postoperative period has been measured according to the number of days on parenteral analgesics. All the patients were ambulated after 24 hrs of surgery and are encouraged for oral feeds. Nasogastric tube and urinary catheter were removed after 24 hrs. The end points measured in both the groups are duration of surgery, duration of post-operative pain, post-operative local complications, duration of hospital stay, return to normal activity, recurrence rates and cosmeses.

**Inclusion & Exclusion Criteria**

Patients with incision hernia, age group either 20 or > 20 age group was included in this study. Patients with age group < 20 or > 60 age group were excluded in this study.

**Data Analysis**

Data were analyzed by using Microsoft excel.

**RESULTS**

**Table 1: Comparative study according to age**

Age	Open Repair Group		Laparoscopic Repair Group	
	(No.)	(%)	(No.)	(%)
20-30	4	10.5%	2	5.2%
31-40	6	15.7%	16	42.2%
41-50	10	26.3%	12	31.5%
51-60	18	47.3%	8	21.1%
Total	38	100%	38	100%

**Table 2: Comparative study according to gender**

Gender	Open Repair Group		Laparoscopic Repair Group	
	(No.)	(%)	(No.)	(%)
Male	8	21.1%	6	15.8%
Female	30	78.9%	32	84.2%
Total	38	100%	38	100%

Two comparative group were taken in this study. One was open repair group and another one laparoscopic repair group. In both study 38 cases were included in each group. Out of 38 cases 21.1% male & 78.9% female in open repair group and 15.8% male & 84.2% female in laparoscopic repair group were isolated. We found that in this study, 47.3% cases 51-60 age group in open repair while 42.2% cases from 31-40 age group were found in laparoscopic repair group followed by other age group. We suggested that 47.3% cases were staying in the hospital postoperatively for 6-10 days while in

laparoscopic repair group 84.3% cases were staying for 1-5 days in the hospital postoperatively. In the open repair group 31.5% cases suffered from wound infection while in another group nobody were suffered from such type of wound infection.

**Table 3: Comparative study according to operative time**

Operative Time (Min.)	Open Repair Group		Laparoscopic Repair Group	
	(No.)	(%)	(No.)	(%)
<60	2	5.2%	0	0%
61-100	6	15.7%	4	10.5%
101-120	10	26.3%	22	57.8%
121-140	4	10.5%	2	5.2%
141-160	8	21.1%	8	21.1%
161-180	8	21.1%	2	5.2%
Total	38	100%	38	100%

P-value= 0.79

**Table 4: Comparative study according to postoperative stay in hospital**

Postoperative Stay (Days)	Open Repair Group		Laparoscopic Repair Group	
	(No.)	(%)	(No.)	(%)
1-5	4	10.5%	32	84.3%
6-10	18	47.3%	6	15.7%
11-15	8	21.1%	0	0%
16-20	2	5.2%	0	0%
21-25	0	0%	0	0%
26-30	6	15.7%	0	0%
Total	38	100%	38	100%

P value 0.000151

**Table 5: Comparative study according to wound infection postoperatively**

Postoperatively Wound infection	Open Repair Group		Laparoscopic Repair Group	
	(No.)	(%)	(No.)	(%)
Yes	12	31.5%	0	0%
No	26	68.5%	38	100%
Total	38	100%	38	100%

P-value <0.0001

**DISCUSSION**

Incisional hernia is the most common long-term complication of abdominal operations, with an incidence of 3-20%.<sup>[7]</sup> Previously, for repair of incision hernia, only open suture repairs were practiced with a recurrence rate more than 50%.<sup>[8]</sup> Now days, recurrence rate has been brought down with the introduction of mesh prosthesis but the wound related complications increased the morbidity of the procedure. Due to surgical technical advancement laparoscopic surgery is enabled the surgeon to decrease the incidence of incisional hernia. But the controversy related to the potential benefits of laparoscopic repair of incisional hernia, motivated the present study to analyze this procedure. The present study consists of 76 patients. Out of 76 patients, 38 patients were related to open repair group and 38 patients belonged to the

laparoscopic repair group. Majority of the patients were females. In laparoscopic repair group 42.2% patients were in the age group of 31-40 years whereas 47.3% of the patients were in the age group of 50-60 years in the open repair group. In most of the cases (66.6%) incisional hernias were located in the lower abdomen. This shows the caesarean section and other gynecological operations are the main cause of incisional hernias in Indian population.<sup>[9,10]</sup> All the patients are presented with swelling over the abdomen and 44.4% of the patients with pain in it. The other important factor to determine the outcome is size of defect. In the present study mean defect size of open group and laparoscopic group are 5.38 cm and 4.68 cm respectively. These results are comparable to other studies. Park et al revealed cardiopulmonary complication rates as 1.7% in laparoscopic repair group and 10.2% in open repair group.<sup>[9]</sup> The present study found that the difference between two surgery groups in terms of cardiopulmonary complication depend upon preoperative ASA score which was significantly greater in open repair group. Mean ASA in open group and in laparoscopic group was 1.44 and 1.22 respectively. Previously, several studies compared the duration of laparoscopic technique with the open method.<sup>[10,11]</sup> Recent literature supports shorter operation duration due to technological advancements with laparoscopic method.<sup>[12-14]</sup>

Carbajo et al reported that in laparoscopic method, operation duration was reduced by 50% with the help of external knotting technique.<sup>[15]</sup> In this study duration of operation in laparoscopic repair group and the open repair group was almost same. It was 125.6 min (range 45 - 180 min) and 128.5 min (range 45 - 180 min) in laparoscopic group and open group respectively. Initially operation duration was longer (165min) with laparoscopic technique, but gradually, it was shortened, as abdominal wall dissection is not needed. In laparoscopic repair group blood loss was less as compared to open repair group. This is beneficial as most of our female patients are anemic. In open repair group there were no significant complications with regard to intra operative complications whereas in laparoscopic repair group there was one major complication i.e. inadvertent enterotomy (ileal perforation) while releasing bowel adhesions which was managed by open- suturing of the perforation. Two cases of laparoscopic group were converted into open method as dense adhesions of bowel to the abdominal wall, hard to be released by sharp dissection in laparoscopic method. The role of surgical expertise cannot be denied at this point.<sup>[16,17]</sup>

In the present study, wound infections are significantly higher in open repair group as compared to laparoscopic group. It has been documented that in open mesh repair the wound related complications range from 3.5% to 18%

whereas in laparoscopic repair it is only 2% De-Maria and Raftopoulos observed that patients had less pain following laparoscopic repair.<sup>[18-21]</sup> Similar results were found in our study. The mean hospital stay was significantly shorter in laparoscopic group (2.88days) in comparison to open repair group (12.11days). In several studies it has been found that the recurrence rate of incisional hernia was 4% for the laparoscopic method and 16.5% open method.<sup>[22]</sup> In this study, the recurrence rate was 0% in laparoscopic group and 31.5% in open group. It is also important to address the cost factor with regard to laparoscopic incisional hernia repair. Mesh (composite mesh) and the disposable tacker which is used to fix the mesh in place are the main contributor to the cost of laparoscopic repair. This study revealed that there was no readmission of laparoscopic incisional hernia repair group for symptoms of complications like adhesion-obstruction, gut erosion or intra-peritoneal use of polypropylene mesh.

## CONCLUSION

The foregone discussion revealed that laparoscopic repair is related with fewer chances of wound infection, the duration of operation is almost equal to open repair, post-operative pain is less, the analgesic requirement is less, duration of hospital stay is less. Results also showed that laparoscopic group patients can resume their work early. In comparison to open repair, laparoscopic approach has shown promising results and is being widely accepted.

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