

Original Research Article

A Comparative Study of Onlay and Pre-Peritoneal Mesh Repair in Incisional Hernia**Pushkar Chandra¹, Surya Prakash², Sonam Gupta^{3*}, Rajendra Singh⁴**¹Senior resident, Department of General Surgery, Vardhman Institute of Medical Sciences, Pawapuri, Nalanda, Bihar, India²Senior Resident, Department of General Surgery, Patna Medical College and Hospital, Patna, Bihar³Junior Resident, Department of Obstetrics and Gynaecology, Mata Gujri Medical College and Hospital, Kishanganj, Bihar, India⁴Associate Professor and HOD, Department of General Surgery, Vardhman Institute of Medical Sciences, Pawapuri, Nalanda, Bihar, India

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Abstract

Background: Aim: To compare preperitoneal mesh repair vs onlay mesh repair in incisional hernia surgery. **Subjects and Methods:** Ninety-eight adult patients age ranged 18-58 years of either gender of incisional hernia were recruited. Demographic, preoperative, operative, perioperative, postoperative and follow-up data were collected. Patients were divided into two groups of 49 each. Group I patients underwent onlay repair and group II underwent preperitoneal repair. Adverse event and Carolinas Comfort Scale (CCF) was also recorded. **Results:** In group I and group II, mean Carolinas comfort scale at 2nd week was 42 and 46, at 2nd month was 34 and 29 and at 6th month was 20 and 16. Peri-operative adverse events were days of retain drain in 3 and 1, wound infection in 2, seroma in 2 and 1, peritonitis in 1. Post-operative complications were sinus formation in 2 and 1, mesh rejection in 1, recurrence in 1 and mesh migration in 1 and enterocutaneous fistula in 0 and 1. A significant difference was observed ($P < 0.05$). **Conclusion:** The preperitoneal repair was found to have better patient compliance and satisfaction with regard to occurrence of complications.

Keywords: Preperitoneal repair, onlay repair, inguinal hernia.

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Introduction

Incisional hernia remains a very common postoperative complication. These are encountered with an incidence of up to 20 % following laparotomy.[1] These hernias enlarge over time, making the repair difficult, and serious complications like bowel obstruction, strangulation and enterocutaneous fistula can occur. Hence, elective repair is indicated to avoid these complications. The recurrence rates after suture repair are as high as 58 %.[2,3]

Incisional hernias are unique in that they are the only abdominal wall hernias that are considered to be iatrogenic.[4] It continues to be one of the more common complications of abdominal surgical procedures and is a significant source of morbidity and loss of time from productive employment. Studies have shown that transverse incisions are associated with a reduced incidence of incisional hernia compared to midline vertical laparotomies, although the data are far from conclusive.[5,6]

Several techniques for the repair of incisional hernia have been described from time to time. The initial method for such repair included anatomical repair, but it was associated with a high rate of recurrence.[7] Subsequently, newer techniques have been added, including prosthetic mesh repair and the laparoscopic repair, which have been reported to produce better results.

Mesh repair has become the gold standard in the elective management of most incisional hernias. It can be categorized according to the way in which the mesh is placed as well as its relationship to the abdominal wall fascia.[8] Mesh can be placed as an underlay deep to the fascial defect (intra-peritoneal or pre-peritoneal), as an inter-layer either bridging the gap between the defect edges or within the abdominal wall musculo-aponeurotic layers (intraparietal), as an on-layer (superficial to the fascial defect), or as a retro-rectus mesh placement.[9] We attempted this study to compare preperitoneal mesh repair vs onlay mesh repair in incisional hernia surgery.

Materials and Methods

The present observational study was conducted at Department of General Surgery, at Vardhman Institute of Medical Sciences, Pawapuri. The study was approved by institutional research and ethical research committee. Informed consent was taken from all the participants after explaining the study protocol. The study was conducted over a period from July 2021 to September 2021.

A total of ninety- eight adult patients age ranged 18-58 years of either gender were part of the study. The study was commenced with the valid written informed consent of all subjects.

Demographic, preoperative, operative, perioperative, postoperative and follow-up data were collected. Patients were divided into two groups of 49 each. Group I patients underwent onlay repair and group II underwent preperitoneal repair. Adverse event and Carolinas Comfort Scale (CCF) was also recorded. Results of the study was compiled for statistical analysis with p value less than 0.05 was considered significant.

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Results

Table 1: Patients distribution

| Groups | Group I | Group II |
|--------|--------------|----------------------|
| Method | Onlay repair | Preperitoneal repair |
| M:F | 28:20 | 26:22 |

Group I patients underwent onlay repair and group II underwent Preperitoneal repair. There were 28 males and 20 females and 26 males and 22 females in group II [Table 1].

Table 2: Comparison of parameters

| Parameters | Variables | Group I | Group II | P value |
|-------------------------------|-------------------------|---------|----------|---------|
| Carolinas Comfort Scale | 2nd week | 42 | 46 | >0.05 |
| | 2nd month | 34 | 29 | |
| | 6th month | 20 | 16 | |
| Peri-operative adverse events | Days of retain drain | 3 | 1 | <0.05 |
| | Wound infection | 2 | 0 | |
| | Seroma | 2 | 1 | |
| | Peritonitis | 1 | 0 | |
| Post-operative | Sinus | 2 | 1 | <0.05 |
| | Mesh rejection | 1 | 0 | |
| | Recurrence | 1 | 0 | |
| | Mesh migration | 1 | 0 | |
| | Enterocutaneous fistula | 0 | 1 | |

In group I and group II, mean Carolinas comfort scale at 2nd week was 42 and 46, at 2nd month was 34 and 29 and at 6th month was 20 and 16. Peri-operative adverse events were days of retain drain in 3 and 1, wound infection in 2, seroma in 2 and 1, peritonitis in 1. Post-operative complications were sinus formation in 2 and 1, mesh rejection in 1, recurrence in 1 and mesh migration in 1 and enterocutaneous fistula in 0 and 1. A significant difference was observed ($P < 0.05$).

Discussion

Incisional hernia is defined as "Any abdominal wall gap with or without a bulge in the area of a post-operative scar perceptible or palpable by clinical examination or imaging." It is the only hernia considered to be truly iatrogenic.[10,11] Incisional hernia continues to be one of the common post-operative complications of abdominal surgery. Such hernias can occur after any type of abdominal wall incision, although the highest incidence is seen with midline and transverse incisions.[12,13] Despite the advances in the understanding of the anatomy and physiology of the abdominal wall, the choice of suture materials and the knowledge of closure techniques, the incidence of incisional hernias continues to be 2-11% after laparotomy. Maximum incidence (63%) of incisional hernia occurs during the first 24 months after surgery.[14,15]

In our study, Group I patients underwent onlay repair and group II underwent Preperitoneal repair. There were 28 males and 20 females and 26 males and 22 females in group II. In a study by Natarajan et al.,[16] thirty patients were randomised and included in the study. Eighteen patients were women and 13 were men, and the mean age was 56.3 years (28–75). Thirteen patients underwent onlay mesh repair, 11 patients underwent preperitoneal repair and 6 patients underwent laparoscopic IPOM. In the perioperative period, seroma collection occurred in 38.5 % of the patients undergoing onlay repair. The number of days of retained drain was observed to be longest in the onlay group. Wound infection in 16.7 % of the patients occurred equally among all the groups. Sinus formation was the most common early postoperative period, which occurred in 46 and 9 % of the patients in onlay and preperitoneal groups, respectively. A single case of Prolene sinus formation was seen in the preperitoneal group

which subsided with antibiotic treatment. Adverse effects were rarely observed in the late postoperative period with only two Prolene sinus formations and one mesh rejection being observed in the onlay group. A single case of recurrence of hernia was observed in the onlay repair group during the 7th month of follow-up. There were no late postoperative complications in preperitoneal repair. The Carolinas Comfort Scale score survey was completed satisfactorily. The included study patients (30 in number) completed the questionnaire at end of the 2nd week. Only 27 patients completed the survey at the end of the 2nd and 6th months. The results of the symptoms for each activity in areas of mesh sensation, pain and movement limitation were observed. These scores were observed to decline gradually over a period of 6 months.

We observed that in group I and group II, mean Carolinas comfort scale at 2nd week was 42 and 46, at 2nd month was 34 and 29 and at 6th month was 20 and 16. Peri-operative adverse events were days of retain drain in 3 and 1, wound infection in 2, seroma in 2 and 1, peritonitis in 1. Post-operative complications were sinus formation in 2 and 1, mesh rejection in 1, recurrence in 1 and mesh migration in 1 and enterocutaneous fistula in 0 and 1. Rajsiddharth et al.,[17] studied the anatomical, etiological and clinico-pathological factors leading to ventral hernias and to study the different techniques of repair of ventral hernia with emphasis on pre-peritoneal and onlay mesh repair and their outcomes and patients were preoperatively assessed clinically and by ultrasonography to confirm the diagnosis. 30 patients each underwent pre-peritoneal and onlay mesh repair. Seroma formation, infection, and chronic pain were seen in 20%, 13.33%, 20% patients, respectively, in onlay mesh repair group and in 10%, 6.66%, and 3.33% patients, respectively, in pre-peritoneal mesh repair group. Recurrence was seen in 10% patients in onlay group. No recurrence was seen in the pre-peritoneal mesh repair group. Associated factors' morbidity was also found to be higher in onlay group. Seroma formation, infection, and the chronic pain were commonly associated with onlay mesh repair compared to preperitoneal mesh repair. Recurrence is higher in cases of ventral hernias operated by onlay mesh repair especially in cases with comorbidities such as obesity, diabetes, and multiparity. Considering

all these observations, we concluded that pre-peritoneal mesh repair is superior to onlay mesh repair.

Conclusion

The preperitoneal repair with abdominoplasty was found to have better patient compliance and satisfaction with regard to occurrence of complications.

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