

Original Research Article

# Pre-peritoneal versus on-lay meshplasty in incisional hernia repair

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## Abstract

**Background:** An incisional hernia is a bulge or protrusion that occurs near or directly along a prior abdominal surgical incision. Various surgical techniques including Open tissue repair, double breasting, darning, open and laparoscopic meshplasty have been used to repair the incisional hernias. In this era, we have selected topic 'Pre-peritoneal versus on-lay meshplasty in incisional hernia repair' to focus on advantage and disadvantage of two methods of hernia repair and to provide information regarding indications and benefits of one over another.

**Material and methods:** 77 cases of ventral hernia were taken in On-lay and Pre-peritoneal group. Observations were made with regards to duration and ease of operation, wound complications, hospital stay, morbidity and recurrence. Study profile: group (A): On-lay meshplasty (The prosthetic mesh placed between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath e.g. on the rectus sheath) group (B): Pre-peritoneal meshplasty (The prosthetic mesh placed in the pre-peritoneal plane e.g. Sub lay/ Retro-muscular plane).

**Results:** Mean age in On-lay group is 47.96 year. While in Pre-peritoneal group mean age is 48.66 year. Results showing pain is not making difference between two methods in post operative period 6<sup>th</sup> day onwards. The duration of hospital stay was comparable and mean duration in On-lay is 3.51 day and in Pre-peritoneal is 3.9 day. In both this method, out of 50, in 37 patients 15X15 cm prolene mesh (cost Rs. 1800) was used and in 13 patients 10X10 cm prolene mesh (cost Rs. 1000) was used. In both cases hospital spend around Rs. 1500 – 2000 average on hospital stay, drugs, food. General anesthesia used cost around Rs.2000 each patient as compare to spinal anesthesia used in other which cost for Rs. 250 each patient. It showed that Pre-peritoneal method required more time than On-lay. In this study, 6/33 patients develops seroma in on-lay method, while 1/44 patients develops seroma in Pre-peritoneal method in post operative period. P value <0.05, the difference is statistically significant. In this study, 2/33 patients develops wound infection in on-lay method in post operative period, while

0/44 patients develops wound infection in pre-peritoneal method in post operative period. P value <0.05, the difference is statistically significant.

**Conclusion:** In view of less post-operative complications like seroma, wound infection, mesh removal and early returns to routine work and less recurrence; pre-peritoneal meshplasty is better repair for incisional hernia compared to on-lay meshplasty.

## Key words

Incisional hernia, On-lay repair, Pre-peritoneal repair, Complications.

## Introduction

An incisional hernia [1] is a bulge or protrusion that occurs near or directly along a prior abdominal surgical incision. Incisional hernia appears within the 1<sup>st</sup> year after the operation and that 80% appears within first two years. Modern rates of incisional hernia range from 2 to 11%. Out of this 20% of patients undergoing laparotomy develops incisional hernia [2]. Repair of ventral hernias have always been a challenging procedure for the surgeons because of the distorted anatomy following previous surgery. Various surgical techniques including Open tissue repair, double breasting, darning, open and laparoscopic meshplasty have been used to repair the incisional hernias [3]. In spite of ventral hernias repair being done in large numbers there is still unclear consensus about the best repair. In this era, I have selected topic 'Pre-peritoneal versus on-lay meshplasty in incisional hernia repair' to focus on advantage and disadvantage of two methods of hernia repair and to provide information regarding indications and benefits of one over another.

## Aim

- To make comparison between On-lay and Pre-peritoneal method of meshplasty in incisional hernia.

## Objectives

To achieve the aim following criteria were compared between On-lay and Pre-peritoneal method of meshplasty in incisional hernia.

- Operative time
- Post-operative morbidity
- Complications

- Hospital stay
- Return to routine work
- Cost effectiveness
- Recurrence rate [4].

## Materials and methods

77 cases of ventral hernia were taken in On-lay and Pre-peritoneal group. Observations were made with regards to duration and ease of operation, wound complications, hospital stay, morbidity and recurrence. Study profile: group (A): On-lay meshplasty (The prosthetic mesh placed between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath e.g. on the rectus sheath) group (B): Pre-peritoneal meshplasty (The prosthetic mesh placed in the pre-peritoneal plane e.g. Sub lay/ Retro-muscular plane)

## Results

77 patients were taken. (44 pre-peritoneal and 33 on-lay meshplasty was randomly done). We had made following observations and their relevant discussion between On-lay and Pre-peritoneal method of meshplasty of incisional hernia repair. The study ranged from 28 years to 71 years age group. 74% patients were between 31-60 age groups. Mean age in On-lay group was 47.96 year. While in Pre-peritoneal group mean age was 48.66 year. In On-lay group 73% (n=24) patients were female. Pre-peritoneal group 61% (n=27) patients were female. Female forms (n=51) 66% of total study group and Female to male ratio was 1.96:1 showed that incidence of incisional hernia was more in female. Distribution according to previous surgery in the study, (n=23) 30% patients undergone

gynecological procedure in past and that led to incisional hernia, while (n=54) 70% incisional hernia occurred due to surgery for the other cause. In the study, 96% (n=73) patients having previous midline scar, 4% (n=3) patients having Mac burney incision scar while 2 (n=1) having other incision scar. Patients with pain on 3<sup>rd</sup> post operative day receive analgesics as required. On post operative day -3, On-lay group patients having more pain as compared to Pre-peritoneal group. Patients with pain on 6<sup>th</sup> post operative day receive analgesics as required. On post operative day-6, majority of the patients had less pain in both group. Results showed pain was not making difference between two methods in post operative period 6<sup>th</sup> day onwards. The duration of hospital stay was comparable and mean duration in On-lay is 3.51 day and in Pre-peritoneal was 3.9 day. Being a government institute, Patient generally did not bear any cost however government is spending. We had evaluated the approximate average cost as follows. In both this method, out of 50, 37 patients 15X15 cm prolene mesh (cost Rs. 1800) was used and in 13 patients 10X10 cm prolene mesh (cost Rs. 1000) was used. In both cases hospital spend around Rs. 1500 – 2000 average on hospital stay, drugs, food. General anesthesia used cost around Rs.2000 each patient as compare to spinal anesthesia used in other which cost for Rs. 250 each patient. From the data and as mentioned above there was no significant difference of cost between On-lay and Pre-peritoneal meshplasty in this institute.

As compare to other studies, it showed that Pre-peritoneal method required more time than On-lay as per **Table - 1**. Negative suction drain was required in 97% of on-lay repair while it were required in 77 % of pre-peritoneal repair with less seroma formation in later. In majority patient with on-lay meshplasty negative suction drain kept for 4 or more days while in pre-peritoneal repair majority of drain removed after 2 days.

In this study, 6/33 patients developed seroma in on-lay method, while 1/44 patients developed seroma in Pre-peritoneal method in post

operative period as per **Table - 2**. P value <0.05, the difference was statistically significant. In this study, 2/33 patients developed wound infection in On lay method in post operative period, while 0/44 patients developed wound infection in pre-peritoneal method in post operative period. P value <0.05, the difference was statistically significant. From the data, Recurrence rate in the study in On-lay meshplasty was 6%, while in pre-peritoneal meshplasty was 0%. On-lay meshplasty having 6 times higher recurrence rate as compared to Pre-peritoneal meshplasty in 6 month follow up. All the patients were followed up at 15 day, 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> month. It was found that most of the patients operated by Pre-Peritoneal method were able to do their routine work within 15-20 days time, while those operated by on-lay method were able to do their routine work at 1 MONTH. However, after 3 months in both methods, no significant difference seen in context to pain and both are pain free. Thus we concluded that patient can resume to their original work more early in Pre-peritoneal method as compared to that operated by On-lay method.

**Table – 1:** Comparison of operative time in On-lay versus Pre-peritoneal meshplasty.

Method	Mean duration
On-lay	90.8 min
Pre-peritoneal	99.69min

**Table – 2:** Complications.

Early complications	On-lay	Pre-peritoneal
Seroma	6 (18%)	1 (2%)
Wound infection	2 (6%)	---

### Discussion

Most important comparable factors are duration of hospital stay, post-operative complications, recurrence and resume to routine work. In study of Dr. Rajesh Godara, et al. 2006, mean duration of hospital stay in On-lay is 5.9 days and Sublay is 8.3 days [5]. One study showed on-lay

method- 80 min, pre-peritoneal method- 89.3 min [6]. In Dr. Rajesh Godara 2006 study [5] on-lay method- 58.08 min, pre-peritoneal method- 78.15 min. As compare to other studies, it showed that Pre-peritoneal method required more time than On-lay. Seroma (in Pre-peritoneal method in post operative period) P value <0.05, the difference is statistically significant which denotes Pre-peritoneal method having less seroma formation as compared to On-lay method [7]. Wound infection (in pre-peritoneal method in post operative period) P value <0.05, the difference is statistically significant which denotes Pre-peritoneal method having less wound infection as compared to On-lay method [8]. On-lay meshplasty having 6 times higher recurrence rate as compared to Pre-peritoneal meshplasty in 6 month follow up. However for better assessment and comparison larger sample size and longer follow up required [9]. From the data incidence of early complications more in On-lay as compared to Pre-peritoneal Meshplasty. Recurrence noted 06% in on-lay group in study. There were more incidences of Pain, Seroma, and Wound infection in On-lay method as compared to Pre-peritoneal method. Mesh removal rate is higher in On-lay as compared to Pre-peritoneal meshplasty [10]. Patient can resume to their original work more early in pre-peritoneal method as compared to that operated by on-lay method [11, 12].

## Conclusion

In view of less post-operative complications like seroma, wound infection, mesh removal and early returns to routine work and less recurrence ;pre-peritoneal meshplasty is better repair for incisional hernia compared to on-lay meshplasty.

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