

## **Incisional Hernia Repair by Preperitoneal Mesh Application**

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### **I. Introduction**

Incisional hernia is defined as a defect occurring through the operative scar. It is one of the most common conditions requiring major surgery despite advances in surgical techniques and suture material. The incidence of incisional hernia in literature is 2- 11 following all laparotomies 1 and it is a source of morbidity and requires high health care costs. . It is seen more in females, obese and older age group. As a result of high recurrence rate in the repair of incisional hernia, various types of repairs have been used both anatomical and prosthetic. But the results have been disappointing with a high incidence of recurrence-about upto 50% after an anatomical repair and upto 10% following prosthetic mesh repairs 2,3,4. The introduction of prosthetics has revolutionized hernia surgery with the concept of tension free repair. The implantation of prosthetic mesh remains the most efficient method of dealing with incisional hernia<sup>5</sup>. The prosthetic mesh can be placed between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath (onlay mesh repair) as well as in the preperitoneal plane. The main advantage of preperitoneal mesh repair are - Less chance of mesh infection and erosion through skin because the graft lies in preperitoneal plane between posterior rectus sheath and peritoneum, avoids adhesions, bowel obstruction, enterocutaneous fistula and erosion of mesh, minimal morbidity and duration of hospital stay is less compared to other techniques. The main disadvantage is more time consuming, extensive preparation of preperitoneal plane and surgical experience. The preperitoneal (sublay) mesh hernia repair was first described by Renestopa, Jean Rives, and George Wantz . This technique is considered by many surgeons to be the gold standard for the open repair of abdominal incisional hernia 6,7,8,9. The present study was undertaken to evaluate the technique of preperitoneal mesh repair of incisional hernias with regards to post operative complications and recurrences.

### **II. Material And Methods**

This prospective clinical study consists of 53 patients with incisional hernia managed by Preperitoneal mesh repair in Sri Krishna Medical College Hospital, Muzaffarpur. The patients who were admitted to surgical wards, diagnosed to have incisional hernia and managed by Preperitoneal mesh repair were included in this study. All patients underwent thorough clinical examination and a detailed history and details of earlier operation were asked for. All patients were evaluated for systemic disease or precipitating cause. Patients who had hypertension, diabetes mellitus or cough were controlled preoperatively. Routine investigations were done for all patients including chest x-ray and ultrasonography of the abdomen. A day prior to surgery, shaving of the abdomen and genitalia was done.

A nasogastric tube and Foley's catheter was passed and broad-spectrum antibiotics was given to all patients before the procedure. Patient was explained about the effects and complications of the procedure. The procedure was done under general anaesthesia, spinal or epidural anaesthesia in supine position.

In all cases, old operative scar was excised, generous skin incision were used to permit adequate exposure of hernial sac and defect. The sac was opened and contents were reduced after lysis of the adhesions. The excess sac was excised, peritoneum was closed with absorbable synthetic suture. Adequate preperitoneal plane was prepared between the posterior rectus sheath and peritoneum, mesh was placed and fixed with prolene no. 2-0 or 3-0 sutures. Suction drains were laid on the mesh and brought out through separate stab wounds.

Muscular aponeurotic structures were repaired with prolene no.1 suture. Skin was closed after insertion of suction drain in subcutaneous plane. In the postoperative period, nasogastric aspiration was done, every two hourly in first 24 hours. The nasogastric tube was removed once the patient passed flatus. Foley's catheter was removed on 1<sup>st</sup> post operative day.

#### **Study Design:**

A prospective clinical study consisting of 53 patients with Incisional hernia who were managed by preperitoneal mesh repair is undertaken to investigate the role of preperitoneal mesh repair and its postoperative complications. Fifty-three patients underwent preperitoneal mesh repair of incisional hernia during two year

study . The youngest patient was 26 years old and the oldest was 70 years old. Forty patients (n=43, 81.1%) were females which outnumbered the thirteen (n=10, 18.9%) male patients. The female to male ratio was 4:1 showing that incidence of incisional hernia is higher in females. In all the fiftythree patients, hernia appeared within two years after surgery, 18 developed incisional hernia in first year while 35 had in second year.

**Table 1: Age & Sex wise Distribution of Patients with Incisional Hernia**

Age in	year	Male	Female	Total (%)
15 – 30	2	7	9	(16.9)
31- 50	3	21	24	(45.3)
51- 70	5	15	20	(37.8)

The main presenting complaint in all the fifty-three patients (100%) was swelling of abdomen in the vicinity of the previous operative scar. This was associated with dragging pain at the site of hernia in thirtysix patients (n=36) and irreducibility in four patients (n=4). None of the patients had obstruction or strangulation. Fortyfive (n=45,84.9%) patients had midlines incision causing the incisional hernia. This was followed by Pfannensteil incision in five (n=5,9.4%) and paramedian incision in three (n=3,5.7%) patients.

**Table 2: Type of Incision causing hernia**

Incision type	Frequency (%)
Lower Midline	41 (77.3)
Upper Midline	4 (7.6)
Pfannensteil incision	5 (9.4)
Paramedian	3 (5.7)
Transverse	0 (0)
Total	53 (100)

After preperitoneal meshplasty, the postoperative complications are shown in Table 3. Major wound infection was encountered in four patients (n=4,7.5%) but the mesh was not removed in any of the cases. Only six patients had seroma formation. There were no postoperative complications in 81.2% of cases.

**Table 3: Postoperative Complications of Preperitoneal Mesh repair in Incisional Hernia.**

Complications	Patients (%)
Wound Infection	4 (7.5)
Seroma formation	6 (11.3)
Recurrence	-
Sinus	-
Mesh removal	-
Nil	43 (81.2)

Drains were used in all the patients. The period of drainage ranged from 3-8 days with the average period being 4- 6 days. Followup was carried out for minimum 12 months and maximum 2 years. No recurrence was encountered in the followup group. postoperative day one. Suction drain was removed once the drainage falls to 25 to 30 cc. Antibiotics were continued for five days. Postoperatively, deep breathing exercises, movement of limbs in bed was advised as soon as patient recovered from anaesthesia. Early limited ambulation was done once the patient was able to bear the pain. Skin sutures removed on 10th day and in few cases after 10th day. At discharge, patients were advised to avoid carrying heavy weights and advised to wear abdominal belt. Patients were reviewed after one month and three months in all cases and few cases upto two years. At review, symptoms were asked for and operative site examined for any recurrence. These cases were then analyzed and results were compared with existing literature. An extensive review of literature is carried out. Statistical Methods: Chi-square and Fisher exact test have been used to test the significance of proportions of postoperative complications between present study and other Mesh Repairs (Other studies).

### III. Discussion

In present study, age ranged from 26 years to 70 years and with peak incidence in 31 to 50 age group (45.3%).

As per the Maingot’s studies, mean age was around 45 years<sup>10</sup>. There is a female preponderance noticed with 81.1%. In Bhutia WT et al study, the female : male ratio was 3:1.5 with female preponderance 84%<sup>11</sup>, in this study all patients are presented with history of swelling , associated pain was present in 36 cases. Most of cases in our series, it was reducible hernia (92.5%) and with 7.5% of cases had irreducible hernia. We had approximately 33.9% of cases with early onset of incisional hernia (within one year of previous surgery) whereas 66.1% of cases had onset of incisional hernia in second year. Majority of incisional hernias (80%) developed in the first two years as per international studies<sup>12</sup>.In this study, 77.3% of cases developed incisional

hernia through lower midline incision, 9.4% through Pfannensteil incision, 7.6% through upper midline incision, 5.7% through paramedian incision. In the present study, we encountered 18.8% of cases with postoperative complications of which 7.5% of cases had postoperative wound infection and 11.3% had seroma formation. There was no postoperative complication in 81.1% of cases. Postoperative complications in present study (18.8%) were comparable to other preperitoneal mesh repair studies by Manohar et al<sup>13</sup> which was 14%. In present study, postoperative wound infection occurred in 4 cases (7.5%), which healed by secondary intention. In Ponka series<sup>14</sup>, it accounts for 24%. Bucknell, Cox and Ellis in their of 1129 laparotomy closures, found that 48% of their patients with incisional hernia had previous wound infection and those with wound infection developed hernias almost four times more often<sup>15</sup>. Hameed et al<sup>16</sup> had wound infection in 4%, Antoine Hamy<sup>17</sup> et al 4% cases, Leber et al<sup>18</sup> 4% cases, while Manohar et al had 2% cases. Prevention of wound sepsis is therefore a prime objective in all abdominal operations.

**Table 4: Comparison of postoperative complications in preperitoneal mesh repair (Present study) and other mesh repairs (Other Studies)**

Wound Infection	4(7.5%)	2(4%)	1(2%)	8(4%)	14(4%)
Seroma	6(11.3%)	1(2%)	5(10%)	6(3%)	-
Deep vein thrombosis	-	-	1(2%)	1(0.5%)	-
Postoperative ileus	-	-	-	16(8%)	-
Sinus	-	-	-	12(6%)	-
Recurrence	-	-	-	34(17%)	11(3.1%)

Seroma formation is comparable with Manohar et al study but significantly more compared to Leber et al study<sup>(10)</sup>. In our study, the most of the hospital stay spent in preoperative workup and in the treatment of associated medical illness, if any, to reach the normal parameters for safe surgery. Total duration of hospital stay is increased when risk factors are present and duration of hospital stay after surgery also increased when the risk factors are present. In present study, we had followed up all the patients after discharge for 15 days, 1 month, 3 months and few cases upto 24 months of duration. There was no recurrence of incisional hernia noticed in the present study. de Vries Relingh TS et al reported a recurrence rate of incisional hernia following different techniques of mesh repair as follows: In onlay technique it was 28.3%, inlay technique 44%, and underlay technique 12%<sup>19</sup>. Leber et al reported a recurrence rate of 17%, Antonie Hamy et al 3.1% of cases (12). There was no recurrence in Hameed et al and Manohar et al study.

#### IV. Conclusion

Less number of postoperative complications noticed in present study. No recurrence noticed in this study. In the present study, preperitoneal mesh repair had excellent long-term results with minimal morbidity.

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