



## INLAY VERSUS ONLAY MESH REPAIR IN THE TREATMENT OF INCISIONAL HERNIA

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### ABSTRACT

An incisional hernia is a common complication following abdominal surgery. It is known since the time of laparotomy. An incisional hernia is a true iatrogenic hernia. An incisional hernia occurs in 10-20 % of the patients following abdominal surgery. Many factors have been associated with incision hernia like age, sex, obesity, postoperative complications, type of surgery<sup>2</sup>. The most important factor is wound infection<sup>3</sup>. All these present a challenging problem to the surgeon. A thorough understanding of the anatomy of the anterior abdominal wall and its biodynamics is important for a successful repair of incisional hernia. An incisional hernia is a complication of laparotomy. It is due to the failure of fascia to heal following a laparotomy. It is more common following midline laparotomy. There are several causes described in the literature for incisional hernia formation. If left untreated, they tend to attain a large size and cause discomfort to the patient or may lead to strangulation of contents. Furthermore, an incisional hernia can incarcerate, obstruct, perforate, or can lead to skin necrosis, all of which increase the risk to patients' life.

### KEYWORD

incisional hernia, abdominal surgery, laparotomy, incarcerate

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An incisional hernia is a common complication following abdominal surgery. It is known since the time of laparotomy. An incisional hernia is a true iatrogenic hernia. An incisional hernia occurs in 10-20 % of the patients following abdominal surgery. Many factors have been associated with incision hernia like age, sex, obesity, postoperative complications, type of surgery<sup>2</sup>. The most important factor is wound infection<sup>3</sup>. All these present a challenging problem to the surgeon. A thorough understanding of the anatomy of the anterior abdominal wall and its biodynamics is important for a successful repair of incisional hernia. An incisional hernia is a complication of laparotomy. It is due to the failure of fascia to heal following a laparotomy. It is more common following midline laparotomy. There are several causes described in the literature for incisional hernia formation. If left untreated, they tend to attain a large size and cause discomfort to the patient or may lead to strangulation of contents. Furthermore, an incisional hernia can incarcerate, obstruct, perforate, or can lead to skin necrosis, all of which increase the risk to patients' life.

Though there is a general agreement that meshplasty should be done to avoid tension<sup>5</sup>, there is no clear evidence indicating the best type of mesh repair with regards to the placement of mesh<sup>6</sup>. The repair with mesh can be done as open or as laparoscopic method. In open repair mesh can be placed using the onlay, inlay, or sublay techniques<sup>6</sup>. In the 'onlay' technique a mesh is placed subcutaneously after wide dissection and is sutured to the anterior rectus sheath. After reducing the sac and its contents, peritoneum is closed and mesh fixed with non absorbable sutures. Suction drain is placed and wound closed in layers. In inlay mesh repair mesh is placed between the layers of the abdominal wall it can be pre rectus or retro rectus. In the laparoscopic method, mesh is placed intra peritoneally<sup>4</sup>

The incidence of recurrence of incisional hernia after a mesh repair is still above 10%. Identification of proper plane of placement of mesh and the technique of fixation may provide answer to the problem

### AIMS AND OBJECTIVES

Currently, the prosthetic repair of incisional hernias is undertaken by three methods. They are inlay, onlay, and underlay techniques. Most surgeons prefer only technique as it is easy. The aim of this study is to compare inlay with only technique of meshplasty in the treatment of incision hernia occurring in the midline with regards to outcome factors. The outcome factors include seroma formation, wound infection, wound edge necrosis, mesh infection, fistula formation, and recurrence rate.

### MATERIALS AND METHODS

The present study onlay versus inlay mesh repair in the treatment of incision hernia is a prospective study which is carried out in the Dept. of general surgery, NRI academy general hospital and medical college, during the period of Both types of meshplastys, onlay, and inlay, are being practiced in various units in the department of general surgery at NRI general hospital. A total number of 45 cases with hernia occurring in the midline or within the two rectus sheaths were included in the study, of which 45 were in onlay and 17 were in inlay, and the follow-up period varied from 10 to 28 months.

Exclusion criteria were incision hernias with a defect of less than three cms in size and incision hernias, which developed hernia away from the midline or lateral to the rectus sheaths.

All patients were examined by a thorough clinical

examination, and a detailed history of previous surgery is noted. All patients were thoroughly evaluated for systemic diseases or precipitating causes. Patients who had hypertension, diabetics, or cough were controlled preoperatively. Routine investigations were done to all the patients, including x-ray chest and ultrasound of the abdomen. Patients were explained about the effects and complications of the procedure. Consent for surgery and the inclusion of the patient in the study was taken. The shaving of the abdominal wall was done before the day of surgery. In order to reduce the infections, all the cases were posted as the first case in the operation theatre. Foleys catheter was passed before starting the procedure. The procedure was carried under spinal anesthesia in the supine position.

In inlay meshplasty preoperative antibiotics Inj.ceftriaxone 1gm was given at the time of induction of anesthesia. Two tablets of metronidazole 400 mg were given the night before surgery. In all cases, to start with transverse incision was employed because it lies in the skin crease, and the effect of intra abdominal pressure on the incision is less. The hernia sac in the subcutaneous plane was identified and defined all around the anterior rectus sheath at its neck, sac was opened, and contents were reduced after releasing the adhesion. The plane between the anterior rectus sheath and rectus muscle was dissected all around the defect for 4 to 5 cms. Laterally the dissection was made up to the lateral margin of rectus muscle on both sides. Peritoneum and posterior rectus sheath were closed with 2-0 prolene in an interrupted manner. A polypropylene mesh of adequate size, which provides an overlap of 4 cms on all sides of the defect, was placed over rectus muscle and fixed with interrupted prolene 2-0 to the posterior surface of the anterior rectus sheath. The first suture was placed at 12 o'clock position. Opposite sutures were placed. A total of about 8 sutures were placed. Additionally, a continuous stitch with 1 prolene was used to stitch the mesh and rectus sheath all around the defect. Suction drain on NO.16 was placed over the mesh and brought out through a separate stab wound. Anterior rectus sheath was closed with 1.0 prolene. Abdominoplasty was done when needed. Skin was closed with 2.0 ethilon after placing another suction drain in subcutaneous tissue. Another antibiotic dose of Inj. Ceftriaxone 1 gm, Inj. Amikacin 500 mg were given on the evening of surgery and from the first postoperative day Tab. Cefuroximeaxetil 500 mg twice a day was given till 5th postoperative day.

In onlay meshplasty antibiotic is Inj. Ceftriaxone 1 gm to be given at the time of induction of anesthesia. Type of incision was based on previous scar skin, and subcutaneous tissue incised and sac was identified. Sac was opened, and the contents were reduced. Thinned out sac was excised. Rectus sheath was closed along with peritoneum with 1.0 prolene. Over that, a polypropylene mesh was placed to overlap 4 cms from the defect and anchored to anterior rectus sheath with 2.0 prolene at multiple sites. No. 16G suction drain was placed over the mesh and brought out through stab wound. Skin and subcutaneous tissue was closed with 2.0 ethilon after securing hemostasis. Another dose of Inj. ceftriaxone was given on the day of surgery and from first postoperative day Tab. monocef 200 mg was given twice a day till the 5th postoperative day. The abdominal binder was placed. Foleys catheter was removed on 2nd day, deep breathing exercises, movements of limbs in bed were advised as soon as the patient recovered from anesthesia. Early limited mobilization was done once patient was able to bear the pain. The immediate postoperative complications were evaluated. Skin sutures were removed usually on 10th day and in few cases after 14 days who presented with seroma formation. At discharge, patients were advised to avoid carrying heavy weights and advised to wear an abdominal binder. Patients were reviewed one month and three months interval and

every three months thereafter. At the review, symptoms were asked for in the postoperative period for all the patients checked for any signs of seroma, fistula or recurrence.



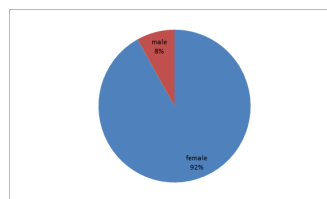
Image showing mesh fixation under the anterior rectus sheath fixed with prolene 1.0 with intermittent and continuous suturing manner

**OBSERVATIONS AND RESULTS**

**TABLE 1 : distribution of patient age according to sex**

Total number of patients	37	%
Male	3	8
Female	34	92

In this study of 37 cases, it has been found that incidence of incision hernia is more common in females than the male with female 92%



Age group	No. of cases in onlay	No. of cases in inlay	Total no of cases	Percentage
20-30	0	0	0	0
31-40	2	2	4	10.8
41-50	9	4	13	35.1
51-60	5	7	12	32.4
61-70	4	3	7	18.9

From this above table, it is learned that the incidence of incision hernia is maximum in the age group of 41-50 years. In this study, the youngest patient was 38 years, and the oldest was 76 years.



**TABLE 3 : mode of presentation**

Mode of presentation	No. of cases	Percentage
Swelling	27	72.9
Swelling and pain	9	24.3
Intestinal obstruction	1	2.7

In our study, 27 patients presented with only abdominal swelling and 9 patients presented with swelling and pain, and 1 patient presented with features of obstruction (swelling, pain, and associated complaints like distension, vomiting, and pain).

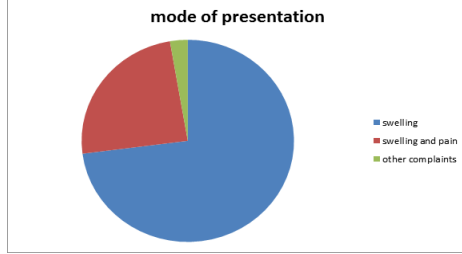


TABLE 4: size of the defect (n-37)

Size of defect	Total no of patients
Up to 5 cm	28
5 to 10 cms	7
More than 10 cms	2

28 Patients had hernia defect, which measured upto 5 cms, and 7 from 5 to 10 cms and 2 patients had defect up to 20 cms.

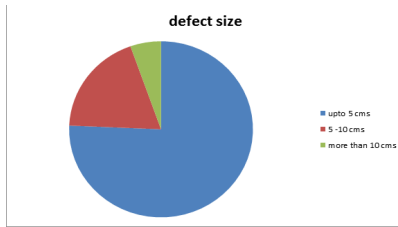


TABLE 5: previous surgeries

Name of the previous surgery	No. of patients in onlay	No. of patients in inlay	Total no of patients
Hysterectomy	6	10	16
Tubectomy	4	3	7
Laparotomy	4	6	10
LSCS	2	2	4

From the above table, it is found that 80% of patients had undergone gynecological procedures. Among which hysterectomy was the most common operation followed by tubectomy and laparotomy

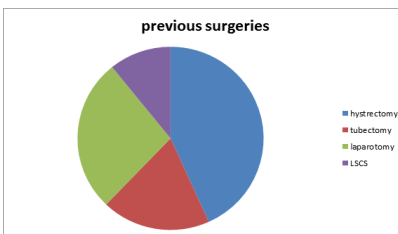
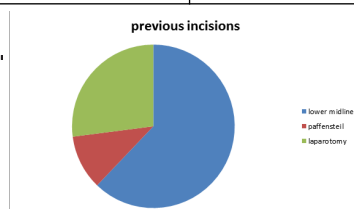


TABLE 6: redo surgeries

	Previous surgery for a hernia	Previous other surgery
Total	5	32

TABLE 7: previous incisions used

Type of incision	No. of cases
Lower midline	23
Paffensteil	4
Laparotomy	10



From this study, it is learned that most of the cases of incisional hernia occurred with the lower midline incision.

Table 8: complications

Complications	Onlay	Inlay	P-value
Seroma	2 (9.5%)	5(31.2)	0.09
Wound infection	0	0	
Skin flap necrosis	2(9.5%)	0	
Mesh infection	1(4.7%)	0	

Table 9:

Meshplasty	Total cases	Lost of follow-up	Recurrence
Onlay	21	0	0
Inlay	16	0	0

The mean duration of follow-up in my study was 12 months. in the follow-up of 16 cases of inlay technique 0 cases showed recurrence, and of 21 cases of onlay technique, there was one case of sinus formation with mesh infection.

CONCLUSION

37 cases of incisional hernia which were admitted in NRI academy of sciences , chinakakani were studied. The stastical data of these cases studied during this period are presented in this study.

It is more common in females compared to males with the ratio of 34:3.

Incidence of incisional hernia was highest in the age group ranging from 41 to 50.

Most of the patients presented with swelling 27 followed by swelling and pain 9 and 1 presented with features of obstruction.

Incisional hernia was more common in patients with previous history of gynaecological operations.

Incisional hernia was more common in relation to infra umbilical incisions.

The size of the defect was found upto 5 cms in 28 cases , upto 10 cms in 7 and more than 10 cms in 2 cases.

5 cases were redo incisional hernia cases in which no recurrence was noted.

In comparison to the outcome in terms of complications there was no significant difference in terms of seroma ,fistula ,wound edge necrosis.

But there was a single case of mesh infection with fistula formation in onlay repair.

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