

Clinical Study and Changing Trends in the Management of Incisional Hernia

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Abstract

Background: Incisional hernia repair especially large ones still remains a challenge to the surgeons even today. With the advent of minimal invasive surgery, rapid advances had taken place in the working concept of incisional hernia. It is a long-term and common complication following abdominal surgery especially in females and estimated to occur in 03 to 13% following laprotomy incisions. At present, no consensus exist on the ideal placement of mesh in open hernia repair. But for laproscopic repair, mesh is always placed in Underlay position. Repair of incisional hernia with mesh either by open or laproscopic repair is now well accepted as gold-standard treatment worldwide. Here, in open hernia repair, we aim to identify the ideal position for mesh placement to assess complications like recurrence rate and surgical site infections. **Materials and Methods:** The study was carried out in the department of General surgery, GEMS and Hospital, Srikakulam, Andhra Pradesh. A total of 60 patients were enrolled for the study from among admitted cases. A thorough clinical assessment, laboratory investigations and radio-imaging studies were performed in all cases. Later the patients were categorized for open and laproscopic repair as per suitability. **Results:** Incisional hernia was found most commonly in the age group of 30-50 years [46.6%]. Females constitute about 61.7%. Middle aged females undergoing laprotomy with midline vertical incision with wound dehiscence are more prone to

develop incisional hernia with in a period of 01-03 years. **Conclusion:** Sub-lay mesh placement in open hernia repair and Underlay in laproscopic repair were found to be ideal and yielded good results.

Keywords: Incisional Hernia; Component Separation Technique; Laproscopic Repair; Onlay Repair; Sub-Lay Repair; Surgical Site Infections.

Introduction

Incisional hernia is a diffuse protrusion of peritoneum and its contents through the anterior abdominal fascia in a previous surgical scar. It is a long-term complication following laparotomies and reported to occur in 03-13% of cases and its incidence is also variable [1]. Of all hernias encountered, incisional hernias can be the most frustrating and difficult to treat. It occurs as a result of excessive tension and inadequate healing of a previous incision associated with surgical site infections. These hernias enlarge over a period of time, leading to pain, bowel obstruction, incarceration and strangulation. Obesity, advanced age, anemia, malnutrition, ascites, pregnancy and other conditions that increase intra-abdominal pressure may pre-dispose for incisional hernia. Chronic pulmonary disease and diabetes mellitus have also been reported as risk factors for its development. Medications such as corticosteroids and chemotherapeutic agents and surgical site infections contribute to poor wound healing and increase the risk for its occurrence [2,3,4,5]. Large hernias can result in change of abdominal domain which occurs when the abdominal contents no longer remain in the abdominal cavity. These large abdominal wall defects can also result from the inability to close the abdomen primarily in the initial surgery.

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Repair of incisional hernia with mesh as opposed to anatomical repair is now well accepted modality of treatment. At present, there is no unanimity of opinion regarding placement of mesh in open repair. Hence, numerous options exist for mesh placement as per patient suitability and surgeons choice. Many data also indicate the association of wound complications with mesh placement [6,7,8]. Onlay repair is an easy technique and places the mesh on the anterior fascia with dissection of flaps and primary closure. In Sublay repair, mesh is placed in rectorectus or preperitoneal position. It is also commonly known as Rives-stopppa and is quite preferred by many surgeons due to low recurrence and few complications [9]. Component separation mesh placement is another technique for repair of large incisional hernia defects. This procedure involves raising large subcutaneous flaps above the external oblique fascia with primary closure at midline. In *underlay repair*, mesh is placed in the intraperitoneal position and well secured to the anterior abdominal wall. Hence, the mesh is well protected from surgical site infections, but exposed to intraperitoneal contents. Such a mesh should possess an anti-adhesive barrier or anti-adhesive properties on the peritoneal site [10-15]. The placement and location of the mesh has its own merits and demerits. With *onlay repair*, there is increased risk of mesh infection and surgical site infection. The *sublay repair* is more complex to perform and is also quite challenging procedure. It protects the mesh from surgical site infections and few recurrences.

Laparoscopic repair got popularized with the advent of minimal invasive surgery. It has changed the entire scenario of incisional hernia repair especially in obese patients and it also avoids major abdominal wall incisions. Several prospective randomized trials and retrospective reports have compared laparoscopic with open incisional hernia repairs and the results tend to favour towards laparoscopic approach. Moreover, the incidence of few post operative complications, low recurrence rate and faster patient convalescence were the benefits in favour of laparoscopic repair. Currently, it is a well accepted procedure for incisional hernia repair which is a changing trend observed in the management.

Materials and Methods

The present study was a hospital based, prospective and observational study done in the Department of Surgery, Great Eastern Medical School and hospital, Srikakulam, Andhra Pradesh from July 2013 to July 2015. After adhering to the selection criteria, 60 participants were enrolled in the

study. Ethical clearance from the institutional committee was obtained before the start of study.

Selection Criteria

Inclusion Criteria

1. All cases of incisional hernia clinically diagnosed and admitted to the General surgery ward.
2. Incisional hernia with impending complications such as irreducibility, intestinal obstruction, incarceration and strangulation.

Exclusion Criteria

1. Uncorrected extreme obesity
2. Ascites due to cirrhosis, heart failure, portal hypertension, pancreatic cancer, hepatitis, uremia.
3. Patients with associated blunt trauma abdomen.
4. Bed ridden patients with wide defects and skin infections.

Patients with clinical diagnosis of incisional hernia were evaluated with a thorough history which includes age, sex, risk factors, mode of presentation, previous surgeries and the site of previous surgical scar. They were also further analyzed for co-morbid conditions like Diabetes mellitus, hypertension and obesity etc.

Routine investigations of blood, urine and ECG were done in all cases. Radiological studies like chest x-ray, Ultra-sonography of abdomen and pelvis, CT abdomen and MRI were done in selected cases.

In the present study, all the cases were operated and the procedure adopted as per their suitability. 20 patients had undergone Onlay repair and 20 patients had sublay repair. 10 patients had laparoscopic repair and 10 patients component separation technique by randomization. The post operative events were recorded to institute proper medication, diet and the length of the hospital stay.

Statistical Analysis

Standard statistical method, like SPSS was adopted for the analysis.

Results

Sixty cases of incisional hernia were enrolled in the study. The common age group encountered ranged from 31-60 years [86.60%]. Average mean age was 48.13 years [Table 1] [16].

The present study revealed that incisional hernia was more common in females [62%] [Table 2] [14,15].

Incisional hernia was most commonly encountered following emergency laprotomy [58.3%] and LSCS [21.7%]. [Table 3].

Patients with median vertical incision are more prone to develop incisional hernia [50%] when compared to pfannensteil incision [26.7%][Table 4][15].

The present study revealed that patients with Wound Dehiscence and secondary suturing [35%] are more vulnerable for incisional hernia compared to wound infection [32%]. Chronic constipation was also the risk factor for late recurrence. [Table5][16].

Table 1: Age distribution

Age groups	No. of cases	Percentage
<30 yrs	8	13.3%
31-40yrs	14	23.3%
41-50yrs	14	23.3%
51-60yrs	11	18.3%
>60yrs	13	21.7%
Total	60	100%

Table 2: Sex incidence

Sex	No. of cases	Percentage
Male	23	38.3%
Female	37	61.7%
Total	60	100%

Table 3: Nature of surgery.(Elective/Emergency)

Previous surgery	No. of cases	Percentage
Emergency laprotomy	35	58.3%
LSCS	13	21.7%
Hysterectomy	08	13.3%
cholecystectomy	03	5%
sterilisation	01	1.7%

Table 4: Type of Surgical incisions and its incidence

Various incisions	No. of cases	Percentage
Median vertical	30	50
Pfannensteil	16	26.7
Paramedian	06	10
Port site	02	3.3
Sub costal	03	05
Transverse	04	6.7
Lumbar	01	1.7

Table 5: Co-relation between incisional hernia and past Surgical complications

Past surgical complications	No. of cases	Percentage
Nil	12	20%
Complications	48	80%
Cough	14	23.3%
Wound Dehiscence	21	35%
wound infection	19	31.7%
Urinary syndrome	06	10%
Chronic constipation	05	8.3%

Most of the incisional hernias occurred with in 01 year of previous surgery accounting for 47% of cases. [Table 6]. Out of 60 cases in the study group, 20 cases underwent Onlay repair, 20 Sublay repair and 10 Component separation technique. Only 10 cases had laproscopic repair [Table 7].

Bleeding is the most common complication that occurred in 25% of Onlay repair. Peritoneal tear occurred in 15% of Sublay repair [Table 8].

In the present study, 35% of Onlay repair patients experienced post operative pain and seroma collection as compared to Sublay repair [Table 9]. 70% of Onlay repair cases require 1-2 weeks of hospital stay as compared to Sublay repair cases which had only 1 week of hospital stay [Table 10].

In the present study, 25% of Onlay repair cases had chronic pain and 10% had recurrence of incisional hernia as compared to Sublay repair [Table 11].

Table 6: Duration of occurrence

Years	<=1 year	1-2years	2-3years	>3 years
No. of cases	28	17	12	3
Percentage	46.7%	28.3%	20%	5%

Table 7: Surgical procedures performed

Procedure	No. of cases	Percentage
Onlay	20	33%
Sublay	20	33%
Component	10	17%
Laprosopy	10	17%

Table 8: Operative complications

Operative complications	Onlay (20 cases)		Sublay (20 cases)		Component (10 cases)		Laprosopy (10cases)	
	cases	%	cases	%	cases	%	cases	%
Bleeding	5	25%	2	10%	1	10%	2	20%
Peritoneal Tear	-	-	3	15%	-	-	-	-
Bowel injury	-	-	-	-	-	-	-	-
Bladder injury	-	-	-	-	-	-	-	-

Table 9: Post operative complications

Post-op complications	Onlay (20 cases)		Sublay (20 cases)		Component (10 cases)		Laproscopy (10 cases)	
	Cases	%	Cases	%	Cases	%	Cases	%
Pain	7	35%	3	15%	2	20%	3	30%
Pelvic collection	-	-	-	-	-	-	2	20%
Mesh infection	1	5%	-	-	-	-	-	-
Wound infection	3	15%	2	10%	2	20%	-	-
Wound dehiscence	2	10%	-	-	1	10%	-	-
Seroma	7	35%	3	15%	2	20%	1	10%
Fever	3	15%	1	5%	1	10%	2	20%

Table 10: Hospital stay

Hospital stay	Onlay		Sublay		Component		Laproscopy	
	Cases	%	Cases	%	Cases	%	Cases	%
<days	1	5%	13	65%	1	10%	7	70%
7-14 days	14	70%	7	35%	8	80%	3	30%
>14 days	5	25%	-	-	1	10%	-	-
Mean	11		8		10		8	

Table 11: Follow up

Follow-up	Onlay 20 cases		Sublay 20 cases		Component 10 cases		Laproscopy 10 cases	
	Cases	%	Cases	%	Cases	%	Cases	%
Chronic pain	5	25%	1	5%	1	5%	1	5%
Recurrence	2	10%	-	-	-	-	-	-

Discussions

Incisional hernia is more common in multiparous females due to precipitating factors such as stretching of abdominal wall musculature, decreased tone of abdominal muscles and replacement of collagen with elastic fibres. Chronic constipation was found to be one of the major risk and precipitating factor interfering with wound healing and late recurrence of hernia. Ersoz et al., Department of Surgery, Ankara university of Medicine, Turkey had analyzed 109 cases of recurrent incisional hernia and found co-relation between chronic constipation and late recurrence.

In the present study group, the mean age of patients encountered with incisional hernia was 48.13 years. The younger age was 24 years and the oldest being 75 years. The sex incidence also shown a female preponderance (61.7%) probably due to laxity of abdominal musculature and repeated pregnancies associated with obesity. Ellis, Gajraj and George also reported a similar mean age incidence of 49.9 years and sex incidence of about 64.6% in females in their study [13].

The present study had also shown a higher incidence of incisional hernia with lower mid-line incision (50%) as compared to pfannensteil incision (26.7%). A.B. Thakore et al shown an incidence of 67.1%; Goel and Dubey (44.6%) in lower mid-line incision. This may be due to absence of posterior rectus sheath below the arcuate line and higher intra-abdominal hydrostatic

pressure in lower abdomen during erect posture [14,15]. About 36.7% of females undergoing gynaecological surgeries with lower midline incision developed incisional hernia in the present study. Goel and Dubey also reported 28.76% incidence among gynaecological procedures. Wound dehiscence (35%), wound infection (31.7%) are the precipitating factors for recurrence of hernia in the study. Buchnall TE et al. reported that surgeries complicated with post operative wound infection are vulnerable more to develop recurrence (48.8%). Larson et al. reported 35.9% and Bose reported 53.6% in their studies [16].

In the present study, 46.7% patients developed incisional hernia within one year of surgery, 17% in one to two years, 12% within 2-3 years and 3% after 3 years. Many studies report similar recurrence rate.

In the study group, 25% patients had bleeding during onlay mesh repair, 10% in sublay repair, 10% in component separation technique and 20% in laproscopic repair during adhesiolysis.

However, the bleeding was managed conservatively with blood transfusion and I.v fluids. 03 patients had peritoneal tear during sublay procedure and it was surgically repaired. There was post operative wound infection in 03 patients (15%) in onlay mesh repair, 10% in sublay mesh repair, 20% in component separation technique. All the cases were managed by antibiotics basing on wound culture and sensitivity. Wound dehiscence occurred in 2 patients in onlay mesh repair and 1 patient in component separation

technique and was managed by resuturing. One patient developed mesh infection during onlay repair which was controlled with antibiotics. Pain was a significant problem in open hernia repair and it occurred mostly in the onlay mesh repair. There was seroma formation in 7 patients (35%) in onlay repair, 15% in sublay, 20% in component separation technique and 10% in laproscopic repair. It was also observed that patients undergoing onlay mesh repair had a prolonged hospital stay when compared to sublay and laproscopic repair. During the follow-up period, 02 patients had recurrence with onlay procedure (10%) which was later repaired. Molloy RG et al. reported recurrence rate of 8% in 45 months of follow up study.

The present study revealed that onlay mesh repair had higher recurrence rate and also wound infection (SSI). Sublay mesh repair had shown lower recurrence rate and SSI. Component separation technique had chronic pain, prolonged hospital stay and wound infection. Laproscopic repair had also shown fewer recurrence and lower SSI in the present study. Sublay repair in open surgery and laproscopic incisional hernia repair had yielded better results in the present study. Currently, they are the gold standard treatment for incisional hernia repair.

Conclusion

The present study concludes that middle aged females who underwent laprotomy with midline vertical incision and wound dehiscence are more vulnerable for incisional hernia.

Sublay placement of mesh yielded improved outcomes with low incidence of hernia recurrence and SSI as compared to onlay and component separation technique. Laproscopic repair had also yielded good results with fewer complications in the study. Currently, it is the treatment of choice for repair of incisional hernia in obese patients.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

Key Messages

Sublay placement of mesh in open incisional hernia repair and underlay in laproscopic repair is the current gold standard treatment.

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