



RESULT OF LAPAROSCOPIC PRIMARY SUTURING AND MESH FIXATION IN INCISIONAL HERNIA

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ABSTRACT

Background: Incisional hernia is any abdominal wall gap with or without a bulge in the area of postoperative scar perceptible or palpable by clinical examination or imaging. Incisional hernia repair is a most common operations.

Open and laparoscopic surgery are procedures for hernia repair.

Aims and objective: The aim of the current study was to analyze that primary defect closure & mesh fixation will gives good result in incisional hernia.

Materials and Methods: A total of 84 patients with hernia were enrolled and all were treated with laparoscopic repair procedure. All hernia were repaired with primary closure with mesh.

Results: 38 were male and 46 were female patients from 84 enrolled patients. Patient's age was 43 ± 41.01 years of age. Out of 84 patients 28 had hernia on upper abdominal and 56 were on lower abdominal. Size of hernia was 6.5 ± 4.95 cm². Total mean operation time was 109 ± 100.41 min. Post-operative stay was 3.5 ± 2.12 days. Out of 84 patients, 2 were converted to open surgery. 2 cases were found for recurrence out of 84 enrolled patients.

Conclusion: Laparoscopic primary defect closure by mesh fixation gives a good approximation and does not show postoperative bulging that gives more satisfaction to the patient.

KEYWORDS : Incisional Hernia, Laparoscopy, Open surgery, Mesh

INTRODUCTION

Incisional hernia (IH) is defined as "any abdominal wall gap with or without a bulge in the area of postoperative scar perceptible or palpable by clinical examination or imaging".¹

The incidence of IH is very high even after great improvement in the techniques and suture materials used for closing the abdominal wall incisions. Using different suture materials, suture repair, prosthetic repair, combination of different techniques or laparoscope, many procedures and techniques were described for preventing and repairing IH. IH is a challenge to surgeons due to high incidence of morbidity and recurrence.¹

Everyday clinical practice, incisional hernia repair is a most common operations. Incisional hernia is a common long-term complication of abdominal surgery and is estimated to occur in 11–20% of laparotomy incisions. Almost 50% of incisional hernias develop within the first 2 years after the primary surgery, and 74% develop after 3 years. The recurrence rate of incisional hernia after primary suture repair is more than 50% and has been reduced to 10–23% after the introduction of prosthetic materials (meshes) in hernia repair.²

Incisional hernias are a diverse problem and for the same different methods of repair indicated for specific defects or locations. Unusual advantages of the open technique include the ability to treat loss of domain with the components separation and restoration of abdominal wall anatomy and function.³ Open hernia repair can be considered as a major operation with significant morbidity due to tissue dissection and mesh-related infections.⁴

Since 1993, when LeBlanc and Booth first described the laparoscopic incisional hernia repair (LIHR) by intraperitoneal insertion of a mesh without closure of the fascial gap, increasing numbers of reports have confirmed that the procedure can be successfully applied and has low rates of complication and recurrence.⁵

The laparoscopic technique has many variations of the

methodology used by surgeons, although several common steps are followed by all surgeons.

1. The procedure starts with entering the peritoneal cavity by using a Veress needle, an open Hasson method, or an optical trocar allowing view of the abdominal wall layers during penetration. Three trocars are normally used, one 10-mm trocar and two 5-mm, which are placed as laterally as possible on the abdominal wall, so they are at an adequate distance from the hernia defect. Most of the operations are completed with 3 trocars.
2. The next step of the operation is the most tedious part: adhesiolysis. The adhesions in the abdomen are lysed using electrocautery or an ultrasonic scalpel. Careful cauterizing or the tripolar cauterizing should be done as it may injure the bowel wall. Perforation of the intestine is the most serious injury associated with laparoscopic ventral hernia repair.
3. After adhesiolysis, the sac contents are gently reduced into the peritoneal cavity, while the peritoneal sac is left in situ. Closure of large hernia defects is recommended by Franklin et al. with non-absorbable sutures, even if only a limited closure is possible. This may be accomplished percutaneously with a suture passer by placing individual sutures. This practice may improve cosmesis and prevent undesirable complications, such as seroma formation.⁴

The introduction of mesh in hernia repair has substantially assisted in the reduction of recurrence rates. A significant reduction in recurrence rates between primary suture repairs compared with mesh repair, 43% to 24%, respectively, for first-time incisional hernia repairs. However, the open mesh repairs still require wide dissection of soft tissue, which contributes to an increased incidence of wound-related complications.⁶

The size of mesh that most closely approaches measurement is selected for the repair. Four main types of mesh have been used which are polypropylene (Prolene, Ethicon, Sommerville, NJ, USA), expanded polytetrafluoroethylene (Dual mesh, Gore-Tex, Gore Medical, Flagstaff, AZ, USA), composite polypropylene+

polytetrafluoroethylene (Composix, CR Bard, Cranston, NJ, USA), or composite polypropylene+ collagen (Parietene, Sofradim, Trevoux, France).⁴

Laparoscopic hernia repair achieves adequate closure of the hernia defect by using intraperitoneal mesh fixation with minimal soft-tissue dissection. The laparoscopic technique has all advantages of the laparoscopic approach, such as less postoperative pain, earlier recovery, and a shorter convalescence period than the open surgery. Moreover, the patients feel more comfortable and tolerate oral intake earlier than after the open procedure. For patients undergoing laparoscopic repair of a primary ventral hernia, there is also a significant cosmetic advantage. With this approach, multiple fascial defects, known as "Swiss cheese" defects, which may be missed during the open repair, can be identified and closed with one mesh. In addition, by placing the mesh intraperitoneally, the intraabdominal pressure pushes upwards and holds the mesh into position. The major debate for this type of repair is which mesh fixation technique should be used, tacks plus transfascial sutures or tacks alone.⁴

Mesh fixation can be carried out with tack alone or with tack and suture. Less recurrence has been observed when mesh has been fixed with tack and suture.

Incisional hernias are asymptomatic except protrusion of the abdominal wall. With time it gets enlarge and becomes symptomatic which causes pain on movements, cough or straining and it interferes with the routine life. Severe pain indicates incarceration or strangulation of internal structures.

The aim of the current study was to analyze that primary defect closure & mesh fixation will give good result in incisional hernia.

MATERIALS AND METHODS

Study was conducted in the Department of surgery, St. Jude's Hospital, Jhansi, India.

Consent was obtained from patient prior to enrollment in study. Total 84 patients were enrolled from Jun 2005 to December 2015.

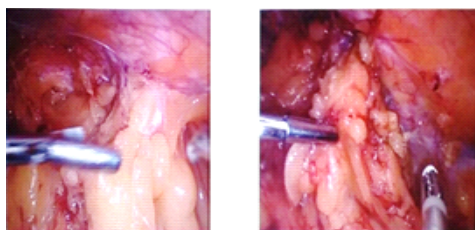
Gender, age, size of hernia, symptoms, operative time, post-operative stay and complications were recorded for all patient.

All patients were undergone biochemical blood investigations, Ultrasound of abdomen, CT abdomen in selected patients, pre-operative physicians/anesthetic consultation.

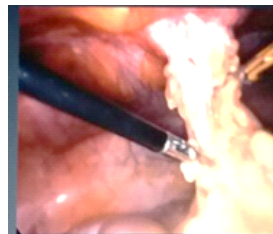
In selected patients, CT abdomen was performed for confirmation of diagnosis. For all patients ultrasound of abdomen was done before planned surgery.

59 patients out of total 84 patients were of obstructive incisional hernia.

With patient in supine position, a first 5 mm trocar was introduced from 2 cm below left subcostal margin in anterior axillary line. Laparoscopy was performed with 5 mm telescope to evaluate the adhesion, contents of herniation and size of defect.



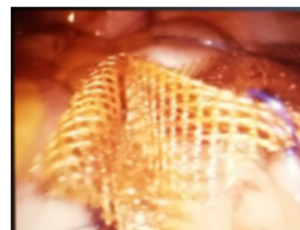
Two more trocars, one of 5 mm and second of 10 mm were inserted under vision. Adhesion were separated by blunt and sharp dissection.



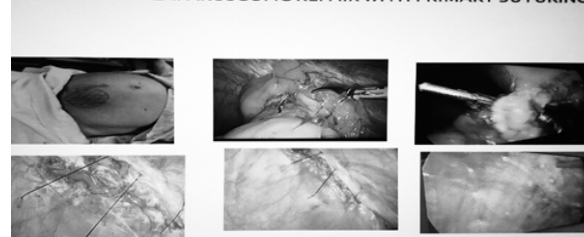
Contents of herniation were reduced. The size of hernia defect was evaluated and abdominal was inspected for any other occult hernia. Now, the primary closure of the defect was closed with proline no.1 suture to approximate the facial defects.



The size of the mesh was selected by taking into consideration of the need for the mesh to overlap the intact abdominal wall by at least 3 cm. A hybrid mesh was prepared for introduction by applying four corner sutures rolled and introduced in the abdominal in the abdominal cavity through 10 mm port to ensure the coverage of defect with at least 3 cm overlap. Mesh was fixed with four corner transfascial sutures tied subcutaneously and multiple trackers. Few additional transfascial sutures were placed in large defect. Good omental cover was given by spreading the omentum to avoid direct contact of mesh and small bowel.



LAPAROSCOPIC REPAIR WITH PRIMARY SUTURING

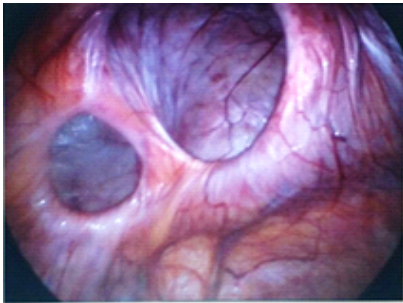


Steps for Laparoscopic Primary Suturing and Mesh Fixation in Incisional Hernia:

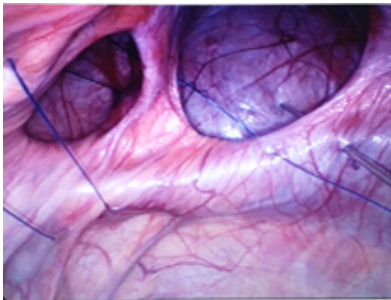
1. Insertion of 5 mm trocar in subcostal margin



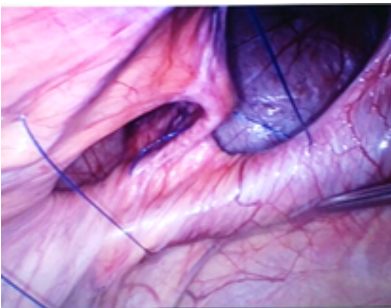
2. Laparoscopic view of large defect



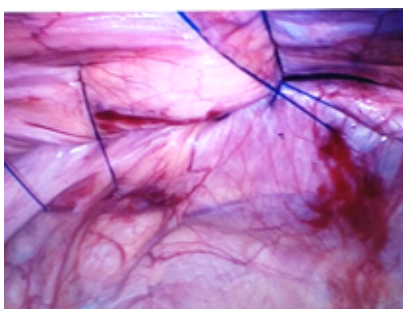
3. Primary suturing performed



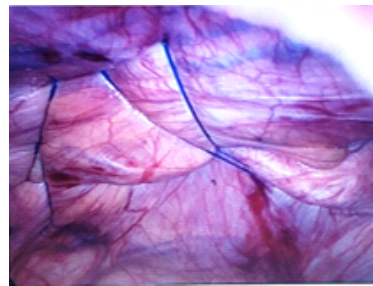
4. Suturing in progress



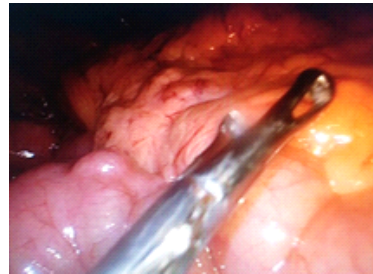
5. Facial margin approximated



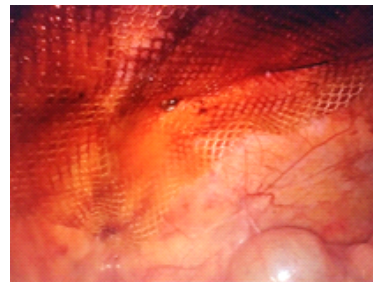
6. Facial margin tied to close the defect



7. Omentum was spread to avoid contact of mesh and bowel loop



8. Fixed Mesh Final Vision



9. Post-operative status



RESULTS AND DISCUSSION

Table 1: Patient Characteristics

Parameter	Data
Sex	Male = 38, Female = 46
Age (Years)	43 ± 41.01 (14 to 72)
Size of Hernia (cm ²)	6.5 ± 4.95 (3 to 10)
Mean operative time (Min.)	58 ± 100.41 (38 to 180)
Post-operative stay (Days)	3.5 ± 2.12 (2 to 5)
Location of Hernia	Upper Abdominal = 28, Lower Abdominal = 56
Converted to open surgery	2 out of 82
Reason for conversion to open surgery	Adhesiotomy was not possible.
Post-operative analgesia	Less as compared to open surgery
Time to return from normal work	14 ± 5.66 (10 to 18 days)
Complications	Recurrence: 2/84, Post-operative adhesion or infection: 0/84

Mean size of hernia defect in this study was observed $6.5 \pm 4.95 \text{ cm}^2$ (3 cm^2 to 10 cm^2). Similar type of results were found by H. Matsui et al.⁵ where mean size of hernia defect was $26.2 \pm 15.8 \text{ cm}^2$ (range 3.1 to 42.4 cm^2). Mean size of hernia defect was found 156 cm^2 (30 to 300 cm^2) by J Razman et al.⁶ Mean size of hernia defect was found $15.39 \pm 11.942 \text{ cm}^2$ (<4 to $>10 \text{ cm}^2$) by V Koduru et al.⁷ Size of hernia defect from patients enrolled in study by Qadri SJF et al.⁸ was found 16 to 120 cm^2 in open repair and 10 to 135 cm^2 in laparoscopic repair.⁸ It has been considered that the size of defect are vary from patient to patient.

Mean operative time for this study was found 58 min (38 to 180 min) whereas in study by H. Matsui et al.⁵ mean operative time for the operation by similar method was $198.4 \pm 49.3 \text{ min}$. As per table presented by J. Razman et al.⁶, mean operative time for laparoscopic ureterolithotomy was 120 ± 34 (75 to 180) min. Moreover, data found by Qadri SJF et al.⁸, mean operative time for open surgery was mentioned as 90.3 (46 to 120) min whereas for laparoscopic surgery it was found as 75.1 (55 to 170) min. In this data, it was observed that laparoscopic surgery is an effective and safe procedure, shortening of the operation time with increased experience.

As per the current study, majority of hernia found in patient with lower abdomen. Similar result was observed by Qadri SJF et al.⁸

According to current study, less post-operative analgesia is required in laparoscopic hernia repair as compared to open repair. As per Qadri SJF et al.⁸, it was observed that less analgesics required for laparoscopic hernia repairs as compared to open hernia repair procedure. According to H. Matsui et al.⁵ there is no significant difference in pain level by laparoscopic or open hernia repair procedures so there may not significant difference between laparoscopic and open hernia repair. It has been observed by J. Razman et al.⁶ that there is less pain by laparoscopic hernia repair compared to open hernia repair therefore in laparoscopic hernia repair, less analgesia may be required.

It has been observed from this study that patients were returned to their routine work on average 12 days (10 to 18 days). Postoperative courses were uneventful with a median postoperative hospitalization period of 8 days according to study by H. Matsui et al.⁵. Whereas as per study by J. Razman et al.⁶, mean hospitalization time was 2 days (1 to 3 days). As per V. Koduru et al.⁷, avg. 5.28 days hospitalization was required in laparoscopic hernia repair whereas avg. 8.57 days hospitalization was required for open hernia repair. Mean hospital stay in open repair group was 4.33 days and 1.53 days in laparoscopic repair group observed by Qadri SJF et al.⁸

In this study, 2 patients were found for recurrence of incisional hernia whereas no case was found for any complication like post-operative adhesion or infection or seroma formation. According to J. Razman et al.⁶ results, one patient developed recurrence by laparoscopic hernia repair however no patient developed recurrence by open hernia repair method. As per V. Koduru et al.⁷, recurrence rate observed was less as compared to open surgery. One case of recurrence was observed by Qadri SJF et al.⁸ in both laparoscopic and open hernia repair methods. Whereas superficial wound infection was observed 4 in open hernia repair method as compared to 2 cases found in laparoscopic group.

CONCLUSION

Laparoscopic primary defect closure by mesh fixation gives a good approximation and does not show postoperative bulging that gives more satisfaction to the patient and no seroma formation due to facial closure

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