



A COMPARITIVE STUDY OF ONLAY VS SUBLAY MESH REPAIR IN INCISIONAL HERNIAS

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ABSTRACT

Introduction: Incisional hernia after abdominal surgery is a well-known complication and the incidence of incisional hernias continues to be 2-11% after laparotomy. The repair of incisional hernia has always been a challenge to the surgeon. Various operative techniques for the repair of incisional hernia are in practice; however, the management is not standardized. The retro rectus mesh placement or the sub lay technique popularized by Rives and Stoppa in Europe, has been reported to be quite effective, with low recurrence rates (0-23%) and minimal complications.

Aims and Objective: The purpose of this study was to compare the traditional on lay mesh and retro rectus mesh placement in incisional hernia repairs in terms of time taken for surgery, early complications (wound infections, Mesh extrusion), and Delayed complications (Recurrence).

Materials and Methods: This is a prospective study which was conducted in the surgical department of our hospital. A total of 60 cases were included in this study. Of these cases, 30 cases were operated by the on lay mesh method and 30 by retro rectus mesh placement. Onlay the patients with midline hernias up to 10 cm in diameter were included in the study.

Result: The operative time for retro rectus mesh placement was insignificantly higher than that of onlay mesh repair, whereas, complications like superficial Surgical site infection SSI were identical in both the study groups, but deep SSI leading to infection of mesh was higher in onlay mesh repair. The recurrence is none

Conclusion: The best position for inserting the material has not been conclusively established. However in few studies it was found that ideal position for mesh repair appears to be retro muscular, where the force of abdominal pressure holds the prosthesis against deep surfaces of muscles. There is paucity of literature but an experimental study has also shown superiority of onlay technique based on different parameters.

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INTRODUCTION

Incisional hernia is defined as "Any abdominal wall gap with or without a bulge in the area of a post-operative scar perceptible or palpable by clinical examination or imaging".[1] It is the only hernia considered to be truly iatrogenic. Incisional hernia continues to be one of the common post-operative complications of abdominal surgery.[2] Such hernias can occur after any type of abdominal wall incision, although the highest incidence is seen with midline and transverse incisions.[3] Despite the advances in the understanding of the anatomy and physiology of the abdominal wall, the choice of suture materials and the knowledge of closure techniques, the incidence of incisional hernias continues to be 2-11% after laparotomy.[4] Maximum incidence (63%) of incisional hernia occurs during the first 24 months after surgery.[3,4] Several techniques for the repair of incisional hernia have been described from time to time. The initial method for

such repair included anatomical repair, but it was associated with a high rate of recurrence. Subsequently, newer techniques have been added, including prosthetic mesh repair and the laparoscopic repair, which have been reported to produce better results. Mesh repair has become the gold standard in the elective management of most incisional hernias.[5] It can be categorized according to the way in which the mesh is placed as well as its relationship to the abdominal wall fascia. Mesh can be placed as an underlay deep to the fascial defect (intra-peritoneal or pre-peritoneal), as an inter-lay either bridging the gap between the defect edges or within the abdominal wall musculo aponeurotic layers (intraparietal), as an on-lay (superficial to the fascial defect), or as a retro-rectus mesh placement.[6] Despite advances in many fields of surgery, incisional hernias still remain a significant problem. There is a lack of general consensus among health professionals regarding optimal treatment. A surgeon's approach is often based on tradition rather than clinical evidence. An understanding of the structural and functional anatomy of the abdominal wall and an appreciation of the importance of

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restoring dynamic function are necessary for the successful reconstruction of the abdominal wall.[7]

AIM

The aim of the present study was to evaluate and compare the efficacy of on-lay mesh repair and retro-rectus mesh placement for repair of incisional hernia

MATERIALS AND METHODS

This is a prospective study carried out from April 2010 to September 2012 in 50 patients with Incisional hernia who were admitted in the surgical department of our hospital. A proforma was designed which included demographic data, signs, symptoms, predisposing risk factors, investigations, diagnosis, type of operative technique, operative time, and complications (immediate and late). Patients were divided into two groups randomly. Group A included 25 patients managed by traditional on-lay mesh repair. Group B included 25 patients managed by retro rectus mesh repair, the operating surgeon being same in all the cases.

Inclusion Criteria

Midline hernias up to 10 cm in diameter.

Exclusion Criteria

- Emergency surgery (incarcerated hernia)
- Parastomal hernia
- Primary umbilical, Para umbilical, Spigelian hernias
- Massive ventral hernias (>10 cm)
- Associated illness: HIV, Hepatitis B Tuberculosis, Uncontrolled Diabetes, chronic obstructive pulmonary disease like asthma.

METHOD

After preliminary investigations, confirmation of diagnosis and pre anesthetic check up, the patients were subjected to the required Surgery. Procedure for the first patient was chosen by lottery and subsequent cases were allotted alternatively. The patients underwent the following procedure as per their groups.

Group A

Onlay mesh repair an overlying incision through the fascia and hernia sac was taken. The entire hernia defect was opened and extended cranially and caudally along the full length of the original incision. Following adhesiolysis, the hernia sac, fascial scar, and subcutaneous fat was dissected away from the rectus sheath (on both sides) for a lateral distance of 7 to 10 cm. The peritoneal hernia sac and associated scar tissue was excised. The fascial defect was closed using a continuous looped nylon suture. A Prolene mesh was cut to the appropriate size, with a 5cm overlap of the defect and sewed longitudinally using (2.0) polypropylene suture on the exposed anterior sheath or external oblique fascia on the lateral sides. Additional quilting sutures were applied at cranial, caudal edges of the mesh and to the central part of the mesh along with the underlying fascia. A suction drain (Romovac no. 16) was kept on both the sides over the mesh.

Group B

Retro rectus mesh placement the retro rectus mesh reinforcement procedure was performed in the similar fashion, with dissection of the sac and subcutaneous fat from the anterior sheath [Figure 2]. On each side, the fascial scar at the

inner edge was incised to uncover the rectus muscle, where an open space was created bluntly along the length of the posterior rectus sheath. This layer was then closed using a nylon suture in the midline [Figure 3]. A Prolene mesh was then cut to the appropriate size, with a 5-cm overlap of the defect and placed between the posterior rectus sheath and rectus muscle above the arcuate line, and in the pre peritoneal space below the arcuate line. The mesh was anchored to the posterior rectus sheath using a polypropylene suture. Quilting sutures were applied at cranial, caudal edges and to the central part of mesh and underlying fascia [Figure 4]. Suction drains (Romovac no. 16) were placed on both sides between the mesh and rectus muscle. The anterior rectus sheath was closed using nylon suture.

Common Procedures for Both Techniques

- All patients were given intravenous antibiotic prophylactic ally: Cefotaxime 1 g intravenous single dose at the time of induction of anesthesia and Cefotaxime 1 g intravenous 12hr for a period of 5 days post-operatively
- Diclofenac 75 mg intramuscular injection was given 8hr for first 24 hr, followed by diclofenac (oral) 50 mg 8hr for next 24 h
- Check dressing was carried out after 48 h. Assessment of wound infection if present, was done as per Southampton scoring system. Wound inspection was done daily and observations were recorded as per the criteria
- Drain was removed if discharge was less than 10 ml in 24 h
- Suture removal was carried out on the 14th post operative day, and patients were discharged on the 15th post operative day if no complications were observed

RESULTS

Age and Gender

Group A included 30 patients, who underwent traditional on lay mesh repair of incisional hernia (11 males and 19 females). The age of the patients ranged from 31 to 55 years old with a mean of 53.84 ± 13.05 years. On the other hand, Group B included 30 patients, who underwent rectus mesh repair (9 males and 21 females). The age of the patients in this group ranged from 28 to 57 years old with a mean of 54.24 ± 10.86 years. There was no statistically significant difference between both groups as regards age and gender ($P > 0.05$).

Predisposing Risk Factors

In our study, 92% of the cases presented with some predisposing risk factors for incisional hernia, however, there was no statistically significant difference between both groups as regards to predisposing risk factors.

The most common risk factor was age more than 50 years (Group A15, Group B14) followed by obesity (Group A11, Group B5), diabetes (Group A8, Group B7) and smoking.

Operative Time

The operative time in Group A ranged from 50 to 110 with a mean of 49.35 ± 8.29 min, while in Group B it ranged from 55 to 110 min with a mean of 63.15 ± 15.0 min with no significant difference between both groups.

Complications

Occurrence of seroma was observed in 4 (13%) patients from Group A and 3 (10%) patients from Group B, and all of them were managed conservatively by repeated aspirations.

Deep Surgical site Infection requiring extrusion of mesh was observed in only one (3%) patient from Group A and one in Group B. Complications like hematoma and sinus formation were not observed in this study. The patients were followed up for a period of 12months.

DISCUSSION

Surgical techniques for the repair of incisional hernia continue to evolve with advances in prosthetic materials and minimally invasive technology. However, the optimal technique for mesh placement has not been established and remains controversial. The main issue is increased risk of infection with the placement of a foreign body in the form of a mesh. The incidence of incisional hernia is highest in the 5th and 6th decades of life with a female preponderance. The high female preponderance can be attributed to the majority of index operations being Gynecological operations with a lower midline incision, which result in incisional hernia.

This compares favorably with our results, where most of the patients were females. Some studies suggest that the use of the sublay technique as a treatment option for incisional hernia appears to be more complicated than the on-lay technique and should be carried out only by staff surgeons.[8] Elsesy, *et al.* in their study noted that the operative time for pre peritoneal mesh repair (74 min) was more than that required for on lay mesh repair (70 min).[9] In our study, the mean operative time was higher in Group B (63.15 min) as compared to Group A (49.35 min). Elsesy *et al.* noted seroma in 12.5% of the cases managed by on-lay mesh repair and 0% by pre peritoneal mesh repair.[9] However, Gleysteen *et al.* Found 10.7% seroma rate for on lay and 16% for pre peritoneal mesh repair.[10] In the present study, seroma was a complication that was noted in 14% of the total patients. Group A had 13% and Group B had 10% incidence of seroma. Gleysteen, *et al.*, in their study also found that rate of infection was higher in patients treated with on lay mesh repair than those treated with retro rectus mesh repair

CONCLUSION

The best position for inserting the material has not been conclusively established. However in few studies it was found that ideal position for mesh repair appears to be retromuscular, where the force of abdominal pressure holds the prosthesis against deep surfaces of muscles. There is paucity of literature but an experimental study has also shown superiority of onlay technique based on different parameters. To date no controlled study has been established that has tested the sublay vs onlay technique. Therefore answer to this question is hypothetical. One European study has shown that Onlay technique had significantly more complications as compared to other technique but we have not found such results in our study. However, I would like to conclude in our study that no significant difference was found in either group.

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