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Original Research Article

Evaluation of the Preperitoneal Mesh Method for the Treatment of Incisional Hernias in a Prospective Clinical Study

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Abstract

Aim: The aim of the study was to evaluate the technique of preperitoneal mesh repair of incisional hernias.

Material & Methods: This prospective clinical study consists of 200 patients with incisional hernia managed by Preperitoneal mesh repair in Department of General Surgery during the period of 1 year.

Results: In the present study, there were 60 male and 140 females. Most of the patients belonged to 31-50 years age group. 144 (72%) patients had midlines incision causing the incisional hernia. This was followed by Pfannensteil incision in 20 (10%) and paramedian incision in 12 (6%) patients. Major wound infection was encountered in 16 patients (8%) but the mesh was not removed in any of the cases. Only 20 patients had seroma formation. There were no postoperative complications in 82% of cases.

Conclusion: Preperitoneal meshplasty found to be efficient method of incisional hernia repair with less post-operative complications.

Keywords: Incisional hernia, Preperitoneal Meshplasty, Postoperative Complication.

Introduction

An incisional hernia is characterized by the presence of a defect that occurs specifically within the surgical scar. Despite advancements in surgical procedures and suture material, this particular ailment remains prevalent and necessitates extensive surgical intervention. The prevalence of incisional hernia in the existing body of research ranges from 2% to 11% subsequent to all laparotomies. [1] This condition poses a significant burden on patients in terms of morbidity and necessitates substantial healthcare expenditures. The prevalence of this condition is higher among females, individuals who are obese, and those in older age groups. Due to the elevated frequency of recurrence in the surgical treatment of incisional hernia, a range of repair methods have been employed, encompassing both anatomical and prosthetic approaches. However, the outcomes have proven to be unsatisfactory, with a significant occurrence of recurrence, ranging from approximately 50% after an anatomical repair to around 10% following prosthetic mesh repairs. [2-4]

The advent of prosthetics has brought about a significant transformation in hernia surgery through the implementation of tension-free repair techniques. The utilization of prosthetic mesh continues to be the most effective approach for managing incisional hernia. [5] The prosthetic mesh has the potential to be positioned either in the onlay mesh repair technique, where it is put between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath, or in the preperitoneal plane. One of the primary benefits of preperitoneal mesh repair is a reduced risk of mesh infection and erosion through the skin. This advantage stems from the placement of the graft in the preperitoneal plane, situated between the posterior rectus sheath and peritoneum. Additionally, this technique helps to prevent complications such as adhesions, bowel obstruction, enterocutaneous fistula, and mesh erosion. Furthermore, preperitoneal mesh repair is associated with minimal morbidity and shorter hospital stays when compared to alternative techniques. [6]

One primary drawback is the increased time required for the intensive preparation of the preperitoneal plane and the need for surgical expertise. The technique of preperitoneal (sublay) mesh hernia repair was initially documented by Renestopa, Jean Rives, and George Wantz in their respective studies. The procedure in question is widely regarded by a significant number of surgeons as the preferred method for performing open repairs on abdominal incisional hernias, often referred to as the gold standard. [7-9]

Therefore, the current study was conducted to assess the efficacy of preperitoneal mesh repair as a therapy for treating incisional hernias, specifically in terms of postoperative complications and recurrence rates.

Materials & Methods

This study encompasses a cohort of 200 patients diagnosed with incisional hernia who had Preperitoneal mesh surgery at the Department of General Surgery, Bhagwan Mahavir Institute of Medical Science, located in Pawapuri, Nalanda, Bihar, India, during a span of one year. This study comprised patients who were admitted to surgical wards, diagnosed with incisional hernia, and treated with Preperitoneal mesh repair.

Methodology

All patients got a comprehensive clinical examination, which included a detailed medical history and inquiries about any previous surgical procedures. A comprehensive assessment was conducted on all individuals to determine the presence of any underlying systemic illness or potential triggering factor. Preoperative control was implemented for patients presenting with hypertension, diabetes mellitus, or cough. Comprehensive examinations were conducted on all patients, encompassing chest radiography and abdominal ultrasonography. Prior to the surgery, all patients were administered broad-spectrum antibiotics and underwent the insertion of a nasogastric tube and Foley's catheter.

The patient received a comprehensive explanation of the potential effects and problems associated with the treatment. The procedure was performed with general anesthesia, spinal anesthesia, or epidural anesthesia while the patient was in a supine position. In each instance, the preexisting operative scar was removed, and a substantial incision was made in the epidermis to ensure sufficient visibility of the hernial sac and the defect. After the adhesions were lysed, the sac was opened and its contents were decreased. The surplus sac was surgically removed, and the peritoneum was afterwards closed with an absorbable synthetic suture. A sufficient preperitoneal space was established by separating the posterior rectus sheath and peritoneum. A mesh was then inserted and secured using prolene sutures, either no. 2-0 or 3-0 in size. Suction drains were strategically placed on the mesh and afterwards extracted using distinct stab incisions. The repair of muscular aponeurotic structures was conducted using prolene no.1 suture. The skin was sutured following the placement of a suction drain into the subcutaneous layer. During the postoperative period, nasogastric aspiration was performed at two-hour intervals throughout the initial 24-hour timeframe. The nasogastric tube was extracted following the patient's expulsion of flatus. The Foley catheter was extracted on the first day following the surgical procedure. The suction drain was removed when reaching a drainage volume of 25 to 30 cc. The administration of antibiotics was sustained for a duration of five days. Following the surgical procedure, it was recommended that the patient engage in postoperative activities such as deep breathing exercises and gentle limb movements while in bed, once they had regained consciousness from the effects of anesthesia. The initiation of early limited ambulation occurred once the patient reached a threshold of pain tolerance. The skin sutures were removed on the 10th day, with a few exceptions where removal occurred after the 10th day. Upon being discharged, patients were provided with instructions to refrain from lifting heavy objects and were recommended to utilize an abdominal belt. All patients were subjected to follow-up evaluations at one-month, three-month, and, in some instances, up to two-year intervals.

During the review, the medical practitioner inquired about the presence of symptoms and conducted an examination of the operation site to detect any signs of recurrence. Subsequently, an analysis was conducted on these cases, and the findings were subsequently compared to the extant body of literature. A comprehensive literature review is conducted.

Statistical Methods

The statistical tests employed in this study to assess the relevance of proportions of postoperative problems in comparison to other studies on Mesh Repairs are the Chi-square test and the Fisher exact test. The statistical software packages SPSS 11.0 and Systat 8.0 were employed for data analysis, while Microsoft Word and Excel were utilized for the creation of tables and other related tasks.

Results

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

Age in year	Male	Female	Total (%)
15 – 30	10	20	30 (15)
31- 50	26	64	90 (45)
51- 70	24	56	80 (40)
Total	60	140	200 (100)

In the present study, there were 60 male and 140 females. Most of the patients belonged to 31-50 years age group.

Table 2: Type of Incision causing hernia

Type of Incision causing hernia	N%
Lower Midline	144 (72)
Upper Midline	24 (12)
Pfannensteil incision	20 (10)
Paramedian	12 (6)
Transverse	0 (0)
Total	200 (100)

144 (72%) patients had midlines incision causing the incisional hernia. This was followed by Pfannensteil incision in 20 (10%) and paramedian incision in 12 (6%) patients.

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

Postoperative Complications	N%
Wound Infection	16 (8)
Seroma formation	20 (10)
Recurrence	-
Sinus	-
Mesh removal	-
Nil	164 (82)

Major wound infection was encountered in 16 patients (8%) but the mesh was not removed in any of the cases. Only 20 patients had seroma formation. There were no postoperative complications in 82% of cases.

Discussion

The precise prevalence of incisional hernia remains uncertain, while several studies in the scientific literature indicate that it likely ranges from 10% to 20%. [10] According to research findings, around two-thirds of occurrences manifest within the initial five years following the procedure, while at least an additional one-third of occurrences emerge between five- and ten-years post-surgery. The prevalence of this condition is higher among females, individuals who are obese, and those in older age groups. [11] Several surgical procedures, such as open tissue repair, double breasting, darning, and open and laparoscopic meshplasty, have been employed for the purpose of repairing incisional hernias. Despite the fact that ventral hernia repairs are performed on a broad scale, there remains a lack of consensus regarding the optimal repair method. [12-14]

The current investigation consisted of a sample size including 60 males and 140 females. The majority of the patients fell within the age range of 31 to 50 years. According to Maingot's research, the average age observed was approximately 45 years. [15,16] An observed trend reveals a predominance of females, accounting for 81.1% of the population. In the study conducted by Bhutia WT et al, it was observed that the ratio of females to males was 3:1.5, indicating a female preponderance of 84%. Out of a total of 15,144 patients, 72% were found to have developed incisional hernia as a result of midline incisions. Subsequently, the Pfannensteil incision was performed in 20 patients, accounting for 10% of the total sample, whereas the paramedian incision was employed in 12 patients, representing 6% of the cohort. According to international surveys, the majority of incisional hernias (80%) often manifest within the initial two years. [16] A total of five patients (8.34%) experienced major wound infections, however, the mesh was not extracted in any of these instances. Seroma development was observed in a total of seven cases. In 80% of cases, no postoperative problems were observed, a rate that is consistent with the findings of Manohar et al in their preperitoneal mesh repair investigations, where the incidence of complications was reported to be 14%. [17]

In our research, a significant portion of the hospitalization period was dedicated to preoperative evaluations and addressing any concurrent medical conditions, where necessary, in order to achieve optimal health parameters for a safe surgical procedure. The presence of risk factors is associated with an extended total period of hospitalization, as well as an increased duration

of hospital stay following surgery. In the current investigation, we conducted a follow-up of all the patients subsequent to their release for various durations, including 15 days, 1 month, 3 months, and in some cases, up to 24 months. No instances of incisional hernia recurrence were observed in the current investigation. The recurrence rate of incisional hernia following various strategies of mesh repair was reported by de Vries Relingh TS et al. The onlay technique had a recurrence rate of 28.3%, the inlay technique had a recurrence rate of 44%, and the underlay technique demonstrated a recurrence rate of 12%. [18]

Conclusion

In conclusion, the present study observed a lower incidence of postoperative complications. No recurrence was observed in this study. The present study also demonstrated that preperitoneal mesh repair is an effective and safe procedure, yielding excellent long-term outcomes and minimal morbidity.

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