

Preperitoneal Meshplasty for the Treatment of Incisional Hernias: A Prospective Clinical Evaluation

Dharmendra Kumar

Associate Professor, Department of General Surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India

Received: 20-12-2022 / Revised: 17-02-2023 / Accepted: 29-02-2023

Corresponding author: Dr. Dharmendra Kumar

Conflict of interest: Nil

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 100 patients with incisional hernia managed by Preperitoneal mesh repair in Department of General Surgery, Netaji Subhas medical College and Hospital, Bihta, Patna, Bihar, India for the period of 2 years.

Results: In the present study, there were 50 male and 150 females. Most of the patients belonged to 31-50 years age group. 82 (82%) patients had midlines incision causing the incisional hernia. This was followed by Pfannensteil incision in 10 (10%) and paramedian incision in 8 (8%) 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 postoperative complications.

Keywords: Incisional Hernia, Preperitoneal Meshplasty, Postoperative Complication.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Incisional hernia is defined as a defect occurring through the operative scar. It is one of the most common conditions requiring major surgery despite advances in surgical techniques and suture material. The incidence of incisional hernia in literature is 2- 11% following all laparotomies [1] and it is a source of morbidity and requires high health care costs. It is seen more in females, obese and older age group. As a result of high recurrence rate in the repair of incisional hernia, various types of repairs have been used both anatomical and prosthetic. But the results have been disappointing with a high incidence of recurrence-about up to 50% after an anatomical repair and up to 10% following prosthetic mesh repairs. [2-4] The introduction of prosthetics has revolutionized hernia surgery with the concept of tension free repair. The implantation of prosthetic mesh remains the most efficient method of dealing with incisional hernia.[5] The prosthetic mesh can be placed between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath (onlay mesh repair) as well as in the preperitoneal plane. The main advantage of pre peritoneal mesh repair are - Less chance of mesh infection and erosion through skin because the graft lies in preperitoneal plane between posterior rectus sheath and peritoneum,

avoids adhesions, bowel obstruction, enterocutaneous fistula and erosion of mesh, minimal morbidity and duration of hospital stay is less compared to other techniques.

Incisional hernia appears within the 1st year after the operation and that 80% appears within first two years. Modern rates of incisional hernia range from 2 to 11%. Out of this 20% of patients undergoing laparotomy develops incisional hernia. [6] Repair of ventral hernias have always been a challenging procedure for the surgeons because of the distorted anatomy following previous surgery. Various surgical techniques including Open tissue repair, double breasting, darning, open and laparoscopic meshplasty have been used to repair the incisional hernias. [7] In spite of ventral hernias repair being done in large numbers there is still unclear consensus about the best repair. The prosthetic mesh can be placed between subcutaneous tissue of anterior abdominal wall and anterior rectus sheath(Onlay mesh repair).As well as in preperitoneal plane create between posterior rectal sheath and peritoneum. The preperitoneal mesh hernia repair was first described by Rene stoppa, Jean Rives and George Wantz.Preperitoneal meshplasty technique are based on the fundamental principle of the

preperitoneal repair described by Stoppa and Rives. The placement of large mesh in the preperitoneal location allows for an even distribution of forces along the surface area of mesh, which may account for the strength of repair and decrease recurrence associated with it. The repair capitalizes on the physics of Pascal's principle of hydrostatics by using the forces that create the hernia defect to hold the mesh in place. The techniques are considered by many surgeons to be the gold standard for the open repair of abdominal incisional hernia. The later technique has several other advantages one of being not transmitting the infection from subcutaneous tissues down to the mesh as it lies quite deep in the preperitoneal plane.

Hence, the present study was undertaken to evaluate the technique of preperitoneal mesh repair of incisional hernias with regards to post operative complications and recurrences.

Materials & Methods

This prospective clinical study consists of 200 patients with incisional hernia managed by Preperitoneal mesh repair in Department of General Surgery, Netaji Subhas medical College and Hospital, Bihta, Patna, Bihar, India for the period of 2 years. The patients who were admitted to surgical wards, diagnosed to have incisional hernia and managed by Preperitoneal mesh repair were included in this study. All patients underwent thorough clinical examination and a detailed history and details of earlier operation were asked for. All patients were evaluated for systemic disease or precipitating cause. Patients who had hypertension, diabetes mellitus or cough were controlled preoperatively. Routine investigations were done for all patients including chest x-ray and ultrasonography of the abdomen. A nasogastric tube and Foley's catheter was passed and broad-spectrum antibiotics was given to all patients before the procedure. Patient was explained about the effects and complications of the procedure. The procedure was done under general anaesthesia, spinal or epidural anaesthesia in supine position. In all cases, old operative scar was excised, generous skin incision were used to permit adequate

exposure of hernial sac and defect. The sac was opened and contents were reduced after lysis of the adhesions. The excess sac was excised, peritoneum was closed with absorbable synthetic suture. Adequate preperitoneal plane was prepared between the posterior rectus sheath and peritoneum, mesh was placed and fixed with prolene no. 2-0 or 3-0 sutures. Suction drains were laid on the mesh and brought out through separate stab wounds. Muscular aponeurotic structures were repaired with prolene no.1 suture. Skin was closed after insertion of suction drain in subcutaneous plane. In the postoperative period, nasogastric aspiration was done, every two hourly in first 24 hours. The nasogastric tube was removed once the patient passed flatus. Foley's catheter was removed on postoperative day one. Suction drain was removed once the drainage falls to 25 to 30 cc. Antibiotics were continued for five days. Postoperatively, deep breathing exercises, movement of limbs in bed was advised as soon as patient recovered from anaesthesia. Early limited ambulation was done once the patient was able to bear the pain. Skin sutures removed on 10th day and in few cases after 10th day. At discharge, patients were advised to avoid carrying heavy weights and advised to wear abdominal belt. Patients were reviewed after one month and three months in all cases and few cases upto two years. At review, symptoms were asked for and operative site examined for any recurrence. These cases were then analysed and results were compared with existing literature. An extensive review of literature is carried out.

Statistical Methods

Chi-square and Fisher exact test have been used to test the significance of proportions of postoperative complications between present study and other Mesh Repairs (Other studies). Statistical software - The statistical software namely SPSS 11.0 and Systat 8.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate tables etc.

Results

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

Age in year	Male	Female	Total (%)
15 – 30	6	26	32 (16)
31- 50	24	64	88 (44)
51- 70	20	60	80 (40)
Total	50	150	200 (100)

In the present study, there were 50 male and 150 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	140 (70)
Upper Midline	24 (12)
Pfannensteil incision	20 (10)
Paramedian	16 (8)
Transverse	0 (0)
Total	200 (100)

82 (82%) patients had midlines incision causing the incisional hernia. This was followed by Pfannensteil incision in 10 (10%) and paramedian incision in 8 (8%) 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 exact incidence of incisional hernia has not been well defined, although a number of reports in the literature suggest that the incidence is probably between 10% to 20%. [8] Research shows that about 2/3rd appear within the first 5 years and that at least another third appear 5-10 years after the operation. It is seen more in females, obese and older age group. [9] Various surgical techniques including open tissue repair, double breasting, darning, open and laparoscopic meshplasty have been used to repair the incisional hernias. In spite of ventral hernias repair being done in large numbers there is still unclear consensus about the best repair. [10] In this era, 'Pre-peritoneal versus on-lay meshplasty in incisional hernia repair' aims to focus on advantage and disadvantage of two methods of hernia repair and to provide information regarding indications and benefits of one over another. [11]

In the present study, there were 50 male and 150 females. Most of the patients belonged to 31-50 years age group. As per the Maingot's studies, mean age was around 45 years. [10] There is a female preponderance noticed with 81.1%. In Bhutia WT et al study, the female : male ratio was 3:1.5 with female preponderance 84%. [12] 45 (83.32%) patients had midlines incision causing the incisional hernia. This was followed by Pfannensteil incision in 6 (11.66%) and paramedian incision in 4 (6.66%) patients. Majority of incisional hernias (80%) developed in the first two

years as per international studies. [13] 82 (82%) patients had midlines incision causing the incisional hernia. This was followed by Pfannensteil incision in 10 (10%) and paramedian incision in 8 (8%) 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 were comparable to other preperitoneal mesh repair studies by Manohar et al. [14]

In our study, the most of the hospital stay spent in preoperative workup and in the treatment of associated medical illness, if any, to reach the normal parameters for safe surgery. Total duration of hospital stay is increased when risk factors are present and duration of hospital stay after surgery also increased when the risk factors are present. In present study, we had followed up all the patients after discharge for 15 days, 1 month, 3 months and few cases upto 24months of duration. There was no recurrence of incisional hernia noticed in the present study. de Vries Relingh TS et al reported a recurrence rate of incisional hernia following different techniques of mesh repair as follows: In onlay technique it was 28.3%, inlay technique 44%, and underlay technique 12%. [15]

Conclusion

Less number of postoperative complications noticed in present study. No recurrence noticed in this study. In the present study, preperitoneal mesh repair had excellent long-term results with minimal morbidity.

References

1. da Silva AL, Petroianu A. Incisional hernias: factors influencing development. Southern medical journal. 1991 Dec 1;84(12):1500-4.
2. Cassar K, Munro A. Surgical treatment of incisional hernia. British journal of surgery. 2002 May;89(5):534-45.
3. George CD, Ellis H. The results of incisional hernia repair: a twelve-year review. Annals of the Royal College of Surgeons of England. 1986 Jul;68(4):185.
4. Bauer J, Harris M, Gorfine S, Kreel I. Rives-Stoppa procedure for repair of large incisional hernias: experience with 57 patients. Hernia. 2002 Sep; 6:120-3.
5. Ahmed I, Mahmood D, Khan J. Use of mesh in the management of recurrent incisional hernias. PJS-Pakistan Journal of Surgery. 1995 ;11(2):101-3.
6. Fortelny RH, Baumann P, Thasler WE, Albertsmeier M, Riedl S, Steurer W, Kewer JL, Shamiyeh A. Effect of suture technique on the occurrence of incisional hernia after elective midline abdominal wall closure: study protocol for a randomized controlled trial. Trials. 2015 Dec;16(1):1-8.
7. Society for Surgery of the Alimentary Tract. Guidelines: Surgical repair of incisional hernias. J Gastrointest Surg. 2004; 8:369-70.
8. Shahi et al. A Prospective Study of complications, risks and causes while repairing the Incisional Hernia by Preperitoneal Meshplasty. International Journal of Health and Clinical Research, 2021;4(18):390-399.
9. Houch JP, Rypins EB, Saffeb IJ et al. Repair of incisional hernia. Surg Gynaecol Obstet 1989; 167:397-399.
10. Michael Zinner, Seymour I. Schwartz, Harold Ellis. Maingot's: Abdominal operations. 10th ed, Vol. 1, 423-425 and 548-572.
11. Ponka JL. Hernias of the abdominal wall. Philadelphia, PA: WB Saunders, 1981.
12. Bhutia WT, Chandra SS, Srinivasan K, Ananthakrishna N. Factors predisposing to incisional hernia after laparotomy and influencing recurrences rate after different methods of repair: A prospective study of 220 patients. IJS 1993; 55 (11): 535-543.
13. Sanders RJ, DiClementi D, Ireland K. Principles of abdominal wound closure: I. Animal studies. Archives of Surgery. 1977 Oct 1;112(10):1184-7.
14. Manohar CS, Ramdev K. Management of incisional hernia by peritoneal mesh repair. International Journal of Basic Medical Sciences. 2010;1(3).
15. deVries Reilingh TS, Van Geldere D, Langenhurst B, Dejong D, van der wilt GJ, van GH. Repair of large midline incisional hernias with polypropylene mesh: Comparison of three operative techniques. Hernia 2004 Feb; 8 (1): 56- 59.