ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 04 | April - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARISON OF OUTCOMES OF SYNTHETIC MESH VS SUTURE REPAIR OF INCISIONAL / PRIMARY VENTRAL HERNIA REPAIR

General Surgery

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ABSTRACT

Incisional hernia is the commonnest long term complication of abdominal surgery and almost 50% of incisional hernias develop within first 2 years after the primary surgery and 74% develop after 3 years. Despite the volume, there is inadequate evidence to support the use of sutures vs mesh for incisionl / primary ventral hernia repairs. **Objective:** To differentiate suture vs mesh repairs for 3 results: recurrence of hernia, surgical site infection (SSI), and seromas. **Method:** A prospective study of patients enrolled for evaluating ventral hernia repair at our hospital from January 2018 to June 2019 and who were eligible for inclusion. Around 75 patients met the inclusion criteria and underwent mesh repair or suture repair of incisional/ primary ventral hernia randomly. The patients were followed up by clinical examination at 7 days, 15 days, 1 month, 6 month and 12 months for various outcomes like recurrence. Surgical site infection and seroma. **Results:** Among 75 patients, there were total 45 mesh repairs and 30 suture repairs . The follow up of mesh repairs revealed 2.2% recurrence rate with 8% seroma and 5% surgical site infections and the follow up of suture repairs demonstrated 6% recurrence rate with 3% seroma and 2.5% surgical site infections.**Conclusion:** Among two methods of incisional / primary ventral hernia repair, mesh repair was found out to be superior in terms of recurrence rates as compared to suture repair but inferior in terms of seroma and surgical site infections to that of suture repair. Further studies are needed to determine which method results in improved outcomes for incisional / primary ventral hernia repair.

KEYWORDS

Incisional, Recurrence, Ventral, Hernia, Mesh

INTRODUCTION

Incisional/ primary ventral hernia is defined as any gap in the abdominal wall from which a swelling is perceptible or palpable by clinical examination or imaging . Also, it demonstrates the breakdown or loss of continuity of a fascial closure. Incisional hernias occur due to excessive tension and inadequate healing of a previous incision, which is often associated with surgical site infection. These hernias enlarge over time and leads to pain, bowel obstruction, incarceration, and strangulation.

Incisional hernias are one of the most common problems faced by general surgeons; they occur in up to 28% of patients after initial laparotomy [2]. Diagnosis and characterization of incisional /primary ventral hernias can be challenging, and few well-designed studies are available to guide surgeons through the process of diagnosis, management, and follow-up in these patients. Despite various techniques of repair which have been already described, the results are still inconclusive. After primary suture repair, rates of recurrence range from 24 percent to 54 percent.[4,6-9] Repairs that include the use of mesh to close the defect have better but still high recurrence rates, up to 34 percent.[8,10] Despite the strong trend toward the use of mesh repairs, it remains unclear whether mesh repair is superior to suture repair. In addition, outcomes of seroma formation and surgical site infection (SSI) are less commonly reported but are important outcomes associated with significant morbidity and cost. Furthermore, wound complications and seromas may be associated with increased rates of hernia recurrence. This study assesses hernia recurrence, seroma formation, and SSI after 2 ways of treatment for hernia repair i.e. mesh and suture.

MATERIALS AND METHODS

- Type of Study : Prospective Cohort Study
- Period of Study : January 2018 to June 2019
- Place of Study : General Surgery OPD ,Mahatama Gandhi Medical College & Hospital, Jaipur

- Institutional Ethics Committee approval was obtained before start of study.
- Written and informed consent was obtained from all participants before enrolment into the study.

SAMPLE SIZE:

This study included all adult patients presenting with incisional /primary ventral hernia in General Surgery OPD of Mahatma Gandhi Medical College and Hospital, Jaipur of single surgical unit 1.

PLAN OF STUDY:

1. Patients presenting to surgical OPD with hernia on the ventral aspect of the abdomen excluding inguinal hernia were evaluated.

2. Inclusion criteria:

All adult patients with incisional/primary ventral hernias who were fit for general anaesthesia were included for surgical correction either laparoscopically or open operation.

3. Exclusion criteria:

- Patients unfit for general anaesthesia,
- incarcerated or strangulated bowel loops or any evidence of vascular compromise on imaging and with pregnancy
- Patients with Inguinal hernia were excluded

The principle used in incisional/primary ventral hernia repair continues same in both laparoscopic and open ventral hernia repair as popularized by Stoppa Rives et al[12]. It includes the use of polypropylene mesh, adequate overlap of hernia defect (more than 5cm) and should be tension free repair.

TECHNIQUE:

Prehabilitation - All adult patients presented in General Surgery OPD of MGUMST with primary ventral/incisional hernias were evaluated by detailed medical history, underwent a thorough physical examination with estimation of the hernia defect with respect to number, size and location. All routine blood parameters including, complete blood counts, renal and hepatic function tests, coagulation profile were performed. Computed tomography / focused Ultrasonography of abdomen were performed for every patient to confirm the location, size and number of defects and its contents and other associated hernia missed on physical examination. After preanaesthetic checkup, all patients underwent hernia repair via primary suture repair or mesh repair assigned randomly. The surgery time and hospital stay of patients after surgery was noted.

All patients were followed up at 7 days, 15 days, 1 month, 6 months

and 12 months interval post operatively via clinical examination in view of hernia recurrence, seroma formation and surgical site infection. Ultrasound examinations were done only when physical examination was inconclusive.

RESULT

A total of 75 patients were enrolled in this study among which, 45 patients underwent mesh repair for incisional/ primary ventral hernia and 30 patients underwent primary suture repair for incisional/ primary ventral hernia. Although patients of all age groups were included in the study, maximum number of patients were between 51-60 years of age, i.e. 33.3% followed by the age group of above 60 years which had 26.7% of cases. The incisional hernias were most commonly seen in patient who underwent LSCS s (36.7%) followed by previous gastrointestinal surgeries(20%) and post-surgical site infections. The median duration of the operation was 40 minutes (range, 20 to 60) for suture repair and 60 minutes (range, 40 to 120) for mesh repair. The median length of the hospital stay was 5 days for suture repair and 4 days for mesh repair. The pooled recurrence rate was 2.2% for mesh repair and 6% for suture repair. The analysis of this data revealed that mesh repair was associated with a lower recurrence rate compared with suture repair ($P < .001$). The pooled seroma rate was 8% for mesh repair and 3% for suture repair. This data revealed that patients undergoing mesh repair had an increased risk of developing seroma complication. The pooled SSI rate was 5% for mesh repair and 2.5% for suture repair which revealed that risk of SSI increased with mesh repair as compared to suture repair.

DISCUSSION

The methods for repairing incisional /primary ventral hernias have generally developed in a practical way by experiences of several surgeons. Many authors have reported favourable results with mesh repair[3,8,10-19] but till now there is insufficient data supporting the mesh repair as the best method of incisional / primary ventral hernia repair. By our study, we report the results of a prospective, randomized trial in which suture repair was compared with mesh repair; the latter was determined to be more effective in terms of rate of recurrence of hernia. In primary suture repair techniques for the repair of incisional hernias, the edges of the defect are brought together, which may lead to excessive tension and subsequent wound dehiscence or incisional herniation as a result of tissue ischemia and the cutting of sutures through the tissues.[20] With mesh repair, the hernial defects can be repaired without tension. In addition, polypropylene mesh, by inducing an inflammatory response induces the synthesis of collagen. Our study establishes that the mesh repair is superior over suture repair with regard to the recurrence of hernia but associated with more seromas and SSIs. Only 1 meta-analysis study has assessed the morbidity associated with mesh vs suture repair of primary ventral hernias. This meta-analysis by Aslani and Brown[16] found that mesh demonstrated a reduction in recurrence rates but no difference in wound complications in the repair of primary ventral hernias. However, this meta-analysis failed to exclude studies with incisional hernias which result from failure of a previous incision, indicating a difference in cause when compared with primary ventral hernias. This meta-analysis also included the patients requiring emergency surgery and incarcerated patients, which are totally different from elective repair. The test for heterogeneity when assessing the association between wound complications and type of repair was $I2 = 47\%$ for the metaanalysis by Aslani and Brown, indicating that the studies were heterogeneous[16]. Aside from these studies, analysis of the effects of mesh and suture use in the treatment of primary ventral hernia repairs has not been analyzed adequately. Our study used several different techniques for repair like simple interrupted suture or the Mayo technique for suture repair and mesh repair, mostly polypropylene, because it is relatively cost effective and easy to handle. When comparing the different techniques for mesh placement, the onlay (prefascial) technique has resulted in fewer recurrences, but the results of the analysiswere not significant[18] In a study by Lau and Patil[19] simple suture repair resulted in a higher recurrence rate when compared with the Mayo technique. In this study, the different techniques for suture and mesh repair were too varied to allow for adequate analysis and have important implications for clinical practice. The mesh repair may result in an increase in seroma formation and SSI risk, but mesh repair may be more beneficial, especially in recurrence. A cost-analysis of treatments for inguinal hernias found that mesh proved to be more cost-effective in the long run. In addition, this study found that the recurrence rate was highly correlated with the cost-effectiveness ratio of the differing techniques.[20] With the increased risk of SSIs and seromas, the cost-effectiveness of mesh repair with reduced recurrence rates may be acceptable compared with other repair types.

CONCLUSION

Among two methods of incisional / primary ventral hernia repair, mesh repair was found out to be superior in terms of recurrence rates as compared to suture repair but associated with increased risk of seroma formation and surgical site infections to that of suture repair. Further comparative effectiveness studies may be undertaken to determine the ideal method for the management of hernia defect and evaluating the impact of different methods on patient outcomes.

CONFLICT OF INTEREST

No conflict of interest relevant to this article was reported.

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