

Comparison of Early Postoperative Pain between Lightweight Mesh and Heavyweight Mesh in Lichtenstein Hernia Repair for Geriatric Patients at Rumah Sakit Siloam Karawaci from January 2018 - December 2019

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Abstract

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Background: Inguinal hernias are one of the most often cases in surgery. Inguinal hernias are usually found in males rather than females. There are two types of meshes in inguinal hernia repairs: heavyweight and lightweight mesh. There werestill a lot of differences in the outcome of each mesh that was used. Therefore, with various different post operative pain results from past research, the author expressesan interest to conduct a research on this topic towards geriatric patients.

Methods: In this cross-sectional comparative study, 45 patients using heavyweight mesh and 45 patients using lightweight mesh herniorrhaphy with Lichtenstein technique in inguinal hernias at RS Siloam Karawaci Lippo Village and RSU were reviewed retrospectively. Patient's data were taken from medical record using purposive-sampling method. Early Postoperative pain on day 1 until 7 were classified following the Visual Analogue Scale (VAS). Incidence of postoperative infection and seroma were assessed in both groups. Collected samples will be processed using Pearson's Chi-Squared test.

Result: This study shows that there is a significant difference between the use of lightweight mesh in reducing moderate early postoperative pain for men above the age of 60 years old ($p = 0.025$) rather than the use of heavyweight mesh. Incidence of other postoperative complications such as infection and seroma have no statistically difference between both groups.

Conclusions: The use of lightweight mesh has the advantage in reducing early postoperative pain from herniorrhaphy using Lichtenstein technique rather than heavyweight mesh in men above 60 years old.

Introduction

Inguinal hernias are one of the most common cases in surgery. About 75% of hernia cases are from inguinal hernias. Inguinal hernias usually occur more often in men (27%) rather than in women (3%)¹. Inguinal hernia is an abnormal protrusion of intra abdominal contents through the myofascial plain of the transversalis and oblique muscles.² Patients with hernias are often found in late conditions because of their

lack of knowledge of the diseases and the high cost of the operations. However, the hernias should be repaired as soon as possible to prevent further complications. If surgery is not conducted, strangulated hernias might be the source of infection that could cause death. Several studies have been conducted and showed that overweight or obese men have a lower risk of having an inguinal hernia than men with normal weight.³

Hernias might grow and contract that can cause an obstruction which will cause clinical symptoms such as pain, discomfort, and vomit.⁴ There are two types of surgery to repair hernias; anterior approach and posterior approach. In the anterior approach, the surgeon will dissect the patient's abdomen and cover the abdominal wall using a surgical mesh. Whereas the posterior approach, a laparoscopic camera is inserted through the patient's umbilical and a surgical mesh will be used to cover the abdominal wall. Both types are used based on each of the surgeon's skills and the facilities that are provided in hospitals.⁵

Two types of surgical mesh are used in hernia repair; heavyweight mesh and lightweight mesh.⁶ Some studies show both surgical mesh doesn't have any difference in postoperative pain, infection, the formation of seroma, and recurrence of hernia repair.⁷ But other studies show that lightweight mesh has more advantages in reducing chronic postoperative pain.⁸

No studies have been done to look for any difference of early postoperative pain from the usage of lightweight mesh and heavyweight mesh for hernia repair both genders at the age above 60 years old specifically in South East Asia. The aim of this study is to know the difference in early postoperative pain from the usage of lightweight mesh and heavyweight mesh for hernia repair both genders at the age above 60 years old.

Material And Methods

Study Design

This study used a retrospective cross-sectional design, reviewing patients who came to Rumah Sakit Siloam Karawaci Lippo Village and Rumah Sakit Umum Siloam

between January and December 2019 with a diagnosed of inguinal hernia and has done inguinal hernia repair using either lightweight mesh or heavyweight mesh with Lichtenstein technique. The exclusion criteria were patients with incarcerated or strangulated hernias and a history of right iliac fossa (RIF) pain.

Data Collection

A total of 90 medical records of patients diagnosed with inguinal hernia that underwent Lichtenstein procedure was collected. Analysis was retrospectively conducted, dividing patients into two groups, group A consists of patients using heavyweight mesh with a non-absorbable polypropylene mesh on a dimension of 7.5 cm x 15 cm for hernia repair and group B consists of patients using lightweight mesh with a partially absorbable polypropylene mesh on a dimension of 6 cm x 11 cm for hernia repair. Demographic data and clinical manifestations of patients were collected from the medical record. Signs and symptoms that were collected are early postoperative pain at seven days, infection, and the formation of seroma. The pain score was assessed by the Visual Analogue Scale (VAS) on day 1 until 7 by the nurse during each visit at the postoperative room. Pain score was classified as mild VAS score 1-3, moderate VAS score 4-7, and severe VAS score >7. Details regarding preoperative characteristics such as intraoperative findings, type of anesthesia, and postoperative complication were recorded on the medical records.

Statistical analysis

The collected data was analysed and compared using Pearson's Chi-squared test.

The measurements were done by using the Statistical Package for Social Sciences (SPSS) version 24.0. A *P* value <0.05 was considered as statistically significant for all analyses.

Results

From January 2018 to December 2019, 90 patients were diagnosed with inguinal hernia that perform Lichtenstein technique for their hernia repair from Rumah Sakit Siloam Karawaci Lippo Village and Rumah Sakit Umum Siloam were included in the study. All of the patients were consecutively examined for 1 year after surgical operation.

From a total of 90 patients, they were divided into two groups. Group A consists of 45 patients using heavyweight mesh for hernia repair and group B consists of patients using lightweight mesh for hernia repair. The demographic characteristics of both groups can be seen in Table 1.

All patient's medical records that were used in this study were Indonesians and aged between 6 until 79 years old. The majority of patients with inguinal hernia were male (87.8%) rather than female (12.2%) patients, with most of them being above 60 years old.

All patients included in this study have been diagnosed with inguinal hernia through history and physical examination findings. Patients usually come with groin pain, stretching of the tissue around hernia that can lead to a burning sensation in the groin. Patients may experience a dragging sensation in the groin, especially at the end of the day after doing activities a whole day. Inguinal hernias are easily diagnosed through valsalva maneuver where the patient was asked to strain down while the physician observes for bulges. All patients from both groups had done hernia repair using

Lichtenstein technique with lightweight mesh and heavyweight mesh under general anesthesia.

Table 1. Patient characteristics

	Group A Heavyweight mesh n (%)	Group B Lightweight mesh n (%)
Gender		
Male	37 (82.2)	42 (93.9)
Female	8 (17.8)	3 (6.8)
Male > 60 years old		
Mild pain	8 (17.8)	15 (33.3)
Moderate pain*	6 (13.3)	1 (2.2)
Female > 60 years old		
Mild pain	3 (6.8)	1 (2.2)
Moderate pain*	0	0

*:p value <0.05

A total of 37 male patients from group A were collected in this study. We found that 8 patients (17.8%) had early mild postoperative pain and 6 patients (13.3%) had early moderate postoperative pain after inguinal repair using Lichtenstein technique. 3 female patients (6.8%) out of 8 female patients from group A had early mild postoperative pain after hernia repair.

Group B consists of 42 male patients (93.9%) and 3 female patients (6.8%). A total of 15 male patients (33.3%) had early mild postoperative pain and one patient (2.2%) had early moderate postoperative pain after inguinal repair using Lichtenstein technique. One female patient (2.2%) had early mild postoperative pain after hernia repair. No female patients from both groups had moderate pain with VAS score 4-7 after inguinal hernia repair for 7 days.

Table 2. Early pain incidence at 7 days

Early pain VAS score	Number	Percentage
Mild (1-3)	37	41.1
Moderate (4-6)	7	7.7
Severe >7	0	0

When Patients Were Divided Into Groups Of Mild VAS (1-3), Moderate VAS (4-7), And Severe VAS (>7) score, it was found that the majority of patients in Rumah Sakit Siloam Karawaci Lippo Village and RSU had early mild postoperative pain for a total of 37 patients (41.1%) and 7 patients (7.7%) had moderate postoperative pain after inguinal hernia repair. No patients from both groups had severe postoperative pain after inguinal hernia with Lichtenstein technique (Table 2).

During the study, there were two patients in group A who had a formation of wound seroma after the operation and signs of infection. However there are no statistically differences between the two groups (p value = 0.50). No recurrence of inguinal hernia were reported in either group after a year of follow up. (Table 3).

Table 3. Surgical outcomes in both groups

	Group A Heavyweight mesh n (%)	Group B Lightweight mesh n (%)	P Value
Seroma	2 (4.44)	1 (2.22)	0.50
Recurrence	0	0	1.0
Wound Infection	2 (4.44)	1 (2.22)	0.50

*:p value <0.05

Discussion

Since the Lichtenstein technique was introduced for hernia repair, the recurrence rate has dropped sharply.⁹ According to scientific literature, hernia mesh repair has proven successful in reducing the frequency of hernia recurrence. Polypropylene heavyweight mesh has become the standard prosthetic mesh for inguinal hernia repair. However, because of its low biocompatibility, it causes foreign body reaction and chronic discomfort after

surgery such as pain.¹⁰ To minimize the effects of those reactions, biodegradable mesh was invented to lower the content of polypropylene and is partially absorbable to maintain strength and rigidity after wound healing.¹¹

For those reasons, this study focused on the early pain assessment and discomfort of patients rather than the recurrence. To measure early pain, we used VAS to measure the severity of pain after surgery. Based on the results, we found that partially absorbable lightweight polypropylene mesh is safe for inguinal hernia repair and improved the quality of life after surgery especially for male patients above the age of 60 years old.

According to this research, the frequency of early postoperative complications (seroma and wound infection) in both groups were the same. All of these results are in accordance with other researchers.^{3,12,13}

There were no significant differences between both groups for inguinal hernia recurrence. Findings in this research did not differ results from other investigations.^{8,14,15} However, the work of O'Dwyer, et al concluded that hernia recurrences were statistically significantly higher in lightweight mesh groups compared to heavyweight groups after three years after surgery. This research couldn't correlate with the frequency of hernia recurrence because each patients were observed for a total of one year after surgery.¹² H.Paajanen's scientific research compared lightweight meshes against heavyweight meshes and found that none of both groups had any differences in reducing pain after surgery under local anesthesia. However, in this research, all surgical procedures were done under general anesthesia.⁷

Mesh was introduced to help repair inguinal hernias. However, it is also a risk factor for development of postoperative pain. Early postoperative pain after inguinal herniorrhaphy with Lichtenstein technique can be defined as pain that only exists after surgery in less than three months. Symptoms include unpleasant feelings such as burning sensation in the surgical area. Some factors that can contribute to the pain are damage to nerves, psychological factors, and even a patient's fear.

Mechanisms such as nerve entrapment or nerve trauma are the most common cause for postoperative pain from this inguinal hernia repair.⁶ Based on our findings, lightweight mesh has proven to reduce postoperative pain in male patients at the age above 60 years old rather than the use of heavyweight mesh. Although lightweight mesh has shown to reduce early postoperative pain, recent studies have reported that in the long-term follow up, the difference between the usage of lightweight mesh and heavyweight mesh are significantly reduced.^{16,17} Over time, the

pain tolerance of patient's will increase until the disappearance or relief from their symptoms in which the act of surgical exploration can be avoided. The new biosynthetic lightweight mesh provides better tissue integration, collagen deposition, and a sustainable neovascularization compared to polypropylene heavyweight meshes.⁷ Our findings are similar to other scientific articles where lightweight mesh significantly reduces early postoperative pain.^{8,9,16}

Conclusion

This study has proven that the use of lightweight mesh has the advantage in reducing early postoperative pain from herniorrhaphy using Lichtenstein technique rather than heavyweight mesh in men above 60 years old. Surgical techniques with a systematic identification and preservation of inguinal region nerves should be considered to prevent chronic groin pain. Treatment for postoperative pain is done by drugs such as steroid or other steroid-like drugs, anesthetics drugs, and surgical exploration of the groin with total neurectomy of all three nerves.

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