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Comparison of Incident of Chronic Pain Post Operations of Preperitoneal Transabdominal Herniorafi Laparoscopy (TAPP) and Totally Extraperitoneal (TEP) in General Hospital Dr. M. Djamil Padang

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ABSTRACT

Introduction : Inguinal herniation is a protrusion of peritoneal component through abdominal wall caused by the weakness of aponeurotica tissue of abdomen. Inguinal herniation is the most common herniation cases in which 291.145 patient registered in Indonesia at 2012 and 87 patients in General Government Hospital of M. Djamil Padang at 2017-2018. Herniation treatment is consisted of herniorrhapy laparoscopy using the TEP or TAPP techniques and both of them are related to the incidence of chronical post-operative pain that was defined by IASP as an uncomfortable sensation lasting for more than 3 months. Method: This research was using retrospective study design. The research was conducted at RSUP Dr. M. Djamil Padang in August - October 2020 with 54 samples. Result: The study found there was 54 cases of inguinal herniation fit to the inclusion criteria with peak age of 82 years old and average of 59.1 years old. Most patients were male (79.62 %). There were 2 patients having chronic pain (7.41%) after herniorrhapy using the TAPP technique and 1 more (3.71%) having chronic pain with TEP technique. Bivariate analysis was done by Fisher Exact Test and the study concluded there was no statistical significance in relationship of chronic post-operative pain incidence with the particular technique chosen at herniorrhapy laparoscopy (p=1.000). **Conclusion:** There was no significant relationship between the incidence of postoperative chronic pain in patients undergoing laparascopic hernioraphy and TEP or TAPP procedure.

1. Introduction

Inguinal hernia is a protrusion or protrusion of the peritoneal component (mesentery, fat, or part of the intestine), which passes through the abdominal wall in the groin area due to weakness of the aponeurotic layer of the abdominal wall. Inguinal hernia is the most common type of hernia, which is about 96% of all Groin Hernia, with a male: female ratio of 9:1.More than 1.000.000 operative procedures for Inguinal Hernia are performed in the United States and more than 100.000 Hernia surgery Inguinal is performed in the UK every year.^{1,2} Based on data from the Ministry of Health of the Republic of Indonesia for the period January 2010 to February 2011, there were 41.516 cases of inguinal hernia in Indonesia. In 2012, Inguinal Hernia ranks eighth in the highest number of diseases in Indonesia with 291.145 cases.³ In West Sumatra Province, especially in Dr. M. Djamil Padang, there were 50 patients with inguinal hernias in 2018 and 37 inguinal hernia patients in 2019 who were treated and had undergone surgery.^{4.5}

Surgery is the only definitive therapy for Inguinal Hernia. Areas that experience weakness will be closed using a mesh, which is a soft, plastic-like knitwear material. Mesh implantation is considered the gold standard for inguinal hernia treatment with a recurrence risk of up to 50% lower than traditional non-mesh techniques. This operative action can be performed with open surgery or laparoscopic methods. Operative measures can help reduce the patient's discomfort by correcting the weak area that causes the lump in the groin in the patient's thigh. ^{6,7,8}

The most common open surgery is the Lichtenstein's Tension Free-Open technique, while the laparoscopic technique is usually done with 2 approaches, namely Trans Abdominal Preperitoneal (TAPP) and Totally Extra Peritoneal (TEP). Things that are taken into consideration in the selection of surgical procedures are the effectiveness of time, cost, recurrence rates, and postoperative complications. The Lichtenstein technique is well known as an open surgery technique with a low recurrence rate for inguinal hernias. This technique is also quite effective in terms of cost and operating time.9 However, according to Prakash, et al., The laparoscopic procedure of Inguinal Hernia has several benefits compared to open surgery such as the Lichtenstein Technique, including minimal postoperative pain and morbidity, earlier healing, Faster return to activity and work times, lower recurrence rates, and better quality of life.8

The laparoscopic inguinal hernia procedure can be performed using several techniques. The TAPP technique requires access to the peritoneal cavity by placing a mesh through the peritoneal incision. The mesh is placed in the pre-peritoneal cavity to cover the herniated area in the inguinal region. Then the peritoneum is closed under the mesh. While the TEP procedure is a more difficult technique than TAPP, the TEP technique can reduce the risk of intra-abdominal organ damage and reduce the incidence of adhesions that can cause obstructive ileus. In addition, TEP requires a shorter operating time because it does not require an incision and closes the peritoneum from the inside. The TEP procedure is also thought to reduce the risk of postoperative chronic pain.^{10,11}

Every surgery has its own risks and potential complications, including recurrence, infection, bleeding, urinary retention, reactions to medication, and injury to the small intestine or testes. In addition, there is also the possibility of chronic postoperative persistent pain that can affect the quality of life of the patient.¹ It is estimated that chronic pain after hernioraphy surgery will reduce 5–10% of the patient's daily productivity and activities.¹²

According to The International Association for the Study of Pain (IASP), pain is an unpleasant sensory and emotional experience associated with tissue damage. Based on its time of onset, postoperative pain can be divided into acute pain and chronic pain. Acute pain is pain that is felt immediately after surgery. Chronic pain is pain that persists and exceeds chronic healing time that lasts for more than 3 months after surgery, as a result of nerve injury or disease affecting the somatosensory system, without a history of pain before hernia surgery, or with a history of pain different from preoperative pain.^{12.13}

Chronic pain after laparoscopic hernioraphy surgery can occur due to several reasons, including trauma to the ilioinguinal nerve, iliohipogastric nerve, genitofemoral nerve, lateral femoral cutaneous nerve due to manipulation, traction, or thermal damage during intraoperative cautery, relapse of the hernia, and fibrosis mesh reactions. resulting in severe inflammation. Usually the type of chronic pain that is felt is neuropathic pain, which is described by the patient as hypoesthesia, dysesthesia, allodynia, or hyperalgesia at the operation site and its surroundings.¹⁴

According to the expert opinion of the International Consensus on the Prevention and Management of Post-Surgical Hernia Pain, identification and preservation of the Ilioinguinal Nerve, Iliohipogastric, and Genital Branch of the Genitofemoral Nerve during hernia surgery with or without mesh can reduce the incidence of postoperative chronic pain by less than 1%, with an incidence of postoperative chronic pain mean 0.8%. However, this is not always possible¹⁵

After developing various hernioraphy surgery methods and techniques, the focus on the recurrence rate as a consideration for selecting the surgical method for the hernioraphy has now shifted to the incidence of chronic pain as a postoperative complication. The significant incidence of postoperative chronic pain and its impact on the quality of life of patients, as well as the absence of research conducted in Indonesia, makes it important to conduct research to compare the incidence of postoperative chronic pain in patients undergoing laparoscopic hernioraphy Total Extraperitoneal (TEP) and Transabdominal Preperitoneal (TAPP) at Dr. M. Djamil Padang.

2. Methods

This study used a retrospective study design. The data used were sourced from the status of medical records and interviews with inguinal hernia patients who underwent laparoscopic hernioraphy with TEP and TAPP procedures.

The research was conducted in August -October 2020, at Dr. M. Djamil Padang. The study population was all inguinal hernia patients who underwent laparoscopic hernioraphy with TEP and TAPP procedures at Dr. M. Djamil Padang in 2017-2019. The sample size in this study were 54 patients who met the inclusion criteria.

3. Results

The results of the study were obtained after collecting data from medical record status and interviews with patients with inguinal hernia who underwent laparoscopic hernioraphy with TEP and TAPP procedures at Dr. M. Djamil Padang in 2017 - 2020. The sample size in this study was 54 patients who met the inclusion criteria. The data were processed using the SPSS computer program. The data were analyzed descriptively and statistically by using the Fisher Exact Test.

Based on table 1 the percentage of hernia patients who underwent herniorrhaphy with the TEP and TAPP procedure was more male than female, namely 43 people (79.62%) versus 11 people (20.38%).

Based on table 2 the percentage for laparoscopic techniques performed on inguinal hernia patients has the same number between TEP and TAPP, namely 27 people per each procedure (50%).

Based on table 3 all hernia patients who underwent herniorrhaphy with the TEP and TAPP procedures had a peak age of 82 years and the lowest was 19 years with an average age of the entire sample being 59.1 years. The mean age of patients undergoing TEP procedure was 59.07 years and TAPP was 62 years.

Based on table 4 through interviews using the Short-form Inguinal Pain Questionnaire (Sf-IPQ), the percentage of hernia patients who underwent herniorrhaphy with the TEP and TAPP procedures who experienced chronic pain was 2 people (7.41%) out of 27 patients who underwent the TAPP procedure and 1 person (3.71%) of 27 patients underwent the TEP procedure. Meanwhile, there were 25 patients who did not experience chronic pain (92.59%) in the TAPP procedure and 26 people (96.29%) in the TEP procedure.

Based on statistical tests, the comparison of postoperative chronic pain in patients undergoing laparoscopic hernioraphy with TEP and TAPP procedures can be seen in table 5 below:

From table 3 it is obtained p = 1.000. These results showed no significant relationship between the comparison of postoperative chronic pain in patients undergoing laparoscopic hernioraphy with TEP and TAPP procedures (p > 0.05). Table 1 Gender characteristics in herniorrhaphy patients with TEP and TAPP procedures

Operating	Male		Female		Total	
technique	f	%	f	%	f	%
TAPP	23	85.1	4	14.8	27	50
TEP	20	74.0	7	25.9	27	50
Total	43	79.62	11	20.38	54	100

Table 2 Characteristics of laparoscopic techniques in hernia patients who underwent herniorafi

Characteristics	f	%
Laparoscopic Herniorrhaphy Technique		
TAPP	27	50.00
TEP	27	50.00
Total	54	100.00

Table 3 Characteristics of average age of hernia patients who underwent herniorrhaphy

Characteristics	Average age
TEP	59.07
TAPP	62
Total	59.1

Table 4 Characteristics of chronic pain in hernia patients who underwent herniorafi with TEP and TAPP

procedures						
Pain scale Total					1	
Characteristics	No chro	onic pain	chroni	c pain	100	~-
	f	%	f	%	f	%
Technique						
TAPP	25	92.59	2	7.41	27	50
TEP	26	96.29	1	3.71	27	50
Total	51	94.4	3	5.5	54	100

Table 5 Comparative statistical analysis of postoperative chronic pain in patients undergoing laparoscopic hernioraphy with the TEP and TAPP procedures

		Postoperative Chronic Pain
TEP and TAPP procedures	Р	1.000
	n	54

4. Discussion

The results of this study indicate that there is no significant association with the incidence of postoperative chronic pain in patients undergoing laparoscopic hernioraphy with TEP or TAPP procedures. This is in accordance with the research conducted by F. Köckerling et al. (2017) that there is no significant difference between TEP and TAPP for intraoperative complications, resurgery related to complications, recurrence, pain during rest, pain during activity, or chronic pain that requires treatment. after the operative. ³⁹

Based on the literature review presented in the International Guideline of Hernia Repair, which is a qualitative study of 71 studies that discusses differences in the incidence of postoperative hernioraphic pain, 6 studies also found no difference in the incidence of chronic pain using either the TEP or TAPP surgical techniques. The difference in the incidence of postoperative complications really depends on the ability and competence of a surgeon. Studies from various RCTs and comparative studies that exist have a lot of bias because they do not include the competency level of the practitioner so that the results are not sufficiently reliable to really say there is or is not a relationship between the choice of surgical technique and the incidence of postoperative chronic pain.⁴⁰

Kumar et al (2013) obtained statistically significant results only on preoperative quality of life and postoperative quality of life in the TEP group. However, when comparing QoL in the postoperative period between the TEP and TAPP groups, no significant difference was shown between the two groups.⁴¹

There are three types of postoperative pain in terms of types, namely somatic pain or what is called nociceptive. Somatic pain usually appears before surgery and is caused by the pathological process of a disease or can be caused by the presence of a mesh. In addition, somatic pain can also be caused by intraoperative processes in the form of injury to ligaments or muscles in the area of operation. The second type of pain is neuropathic pain which is usually caused by injury to a nerve fiber or ganglion. In the hernioraphic condition, there are many nerve branches involved, namely the illioinguinal, illiohipogastric nerves, the genital branches of the genito-femoral nerve and the lateral cutaneous femoral nerve. The most common cause is the adhesive from the mesh used during surgery on one of the above nerve fibers. The third type of pain is visceral pain which usually originates in the intestinal organs. The presence of disruption in the pre-peritoneal tissue such as that occurs during mesh insertion can also cause visceral pain. Of the three types of postoperative pain that can occur, somatic or nociceptive pain is the most commonly reported type of pain. However, in this study, it was not explained the type of postoperative pain that occurred in patients ⁴²

Most of the sexes in this study were male, namely 43 people (79.62%). The same result was also reported by Varcus et al (2016) that most of the patients were male, namely 89 people from a total of 90 samples used in the study.⁴³ Based on research of 2499 people conducted by Belyansky et al (2011) 94.4% in TEP and 93.9% of TAPP are male. This is in accordance with the literature where according to gender, inguinal hernias are nine times more common in men than women.⁴⁴

The percentage for age of hernia sufferers who underwent hernioraphy with TEP and TAPP procedures in this study had a peak age of 82 years and the lowest was 19 years with the mean age of the whole sample being 59.1 years. The mean age in the TAPP group in this study was 59.07 years while the mean age in the TEP group was 59.13 years. This indicates that there is no significant difference between the two procedures in terms of age. The same thing was stated by F. Köckerling et al (2017) which showed that there was no significant difference in the average age of the TEP and TAPP treatment groups.³⁹

Meanwhile, according to research Kumar et al (2013) the average age of patients is 47.1 ± 17 years. The mean age of patients in the TEP group was 50.5 ± 17.3 years and in the TAPP group it was 43.4 ± 16.4 years. Mean age was higher in the TEP group, which was statistically significant (p = 0.006).⁴⁰

Patients' quality of life (QOL) has become a central evaluation parameter for chronic disease and morbidity. Quality of life measures are increasingly being used to evaluate the outcome of surgical procedures and to decide which treatment modality is better. Different results from this study were stated by Myers et al. (2010) who found a significant increase in all measures of quality of life after TEP improvement except social function and mental health.45 However, this difference is understandable because in the study there was no assessment of quality of life before surgery. . Comparisons of quality of life require the assumption that there is no basic heterogeneity between the two groups which may not occur and, therefore, is a potential source of bias.

Postoperative pain is a significant complication

for patients undergoing hernioraphy. The presence of pain will greatly affect the patient's dailv activities which lead to disability. dissatisfaction and ultimately decreased productivity and decreased quality of life. The management of postoperative chronic pain has also generated a lot of controversy and requires expert opinion as it relates to diverse populations and patient pathological conditions.40

Based on the literature, it appears that the presence of postoperative acute pain is also a risk factor for postoperative chronic pain. So that adequate pain management is needed in the prevention of postoperative chronic pain. Existing guidelines mentioning the prevention of postoperative chronic pain incidence also suggest repeat surgery with neurectomy as soon as necessary.⁴⁰

Another study group noted that many other differential diagnoses were associated with chronic post hernioraphy pain. Investigations using ultrasound and MRI can provide clarity whether there is a recurrence of a hernia, hematoma, meshoma or other causes not related to the hernia. This study group also proposed conservative therapy by administering analgesics using NSAIDs, Gabapentin and Pregabalin for approximately 6 months. After that, a neurectomy can be considered. In the present study, no attached postoperative pain management was selected.⁴⁰

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6. Author Contributions

Yudi Ichsan Ramata was in charge of data collection, research administration and writing the original draft. M. Iqbal Rivai and Avit Suchitra are responsible for the statistical analysis and writing of the original draft. All authors have reviewed the latest version of the manuscript.

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