

Open preperitoneal inguinal hernioplasty is more beneficial compares to Lichtenstein hernioplasty

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Abstract

The objective of this study is to compare that the open preperitoneal hernioplasty technique is shorter in incision length (mm), shorter operating time (minute) and less post operative pain (VAS score) with that of in open Lichtenstein technique.

This study was a prospective experimental study, done by a single operator in private hospitals in August 2010 - August 2012. All the subjects in this study were randomly divided into two groups, the number of samples among the open preperitoneal hernioplasty group was 30 and Lichtenstein group 29. In analysis with student-t test, the length of incision line in open preperitoneal hernioplasty group (39.13 ± 3.01 cm) was shorter ($P=0,000$) than Lichtenstein group (57.24 ± 7.64 cm). The operating time ($32,90 \pm 6,73$ minute) was shorter (57.24 ± 7.64 minute) ($P=0,000$). The post operative pain (VAS score $1,90 \pm 0,71$) was less (VAS score 3.28 ± 0.70) ($P=0,000$).

It can be concluded that open preperitoneal hernioplasty technique was more beneficial in the event of shorter incision line, shorter operating time and less post operative pain, compares with that of in Lichtenstein technique.

Keywords: Open preperitoneal hernioplasty, Lichtenstein, VAS score

Introduction

Various herniotomy techniques had been introduced in the past, from the open hernioplasty to those using state-of-the-art advanced equipments. Each of these techniques has their own benefits and disadvantages in regards to their outcomes, costs, simplicity of operational procedures and post operative pain (Maurice B, Luke J, Sam S, 2012). The commonly used open hernioplasty method today in Surabaya-Indonesia is the Lichtenstein technique, which is used as a standard technique in many hospitals in

Surabaya. However, the Lichtenstein technique still leaves a relatively long incision mark, which is a cosmetical disadvantage (Amid P, 2007). Also, the Lichtenstein technique has been known to have an 11% rate of chronic post operative pain (Shyam, 2009). Despite the fact that the Lichtenstein Technique is a tension-free technique, it still causes pain due to the mesh fixation to the conjoint tendon and inguinal ligament (Erhan, 2008). The open preperitoneal hernioplasty technique is also an open hernioplasty technique, this method is a combination of open hernioplasty and laparoscopic technique. The technique is found to be simpler, without the use of laparoscopic equipments and tackers, entering through the preperitoneal space. This technique leaves a smaller incision wound and requires a relatively shorter operation time. Post operative pain is expected to be minimum due to the small incision and the positioning of the mesh is without tension, no fixation needed for the mesh to the surrounding tissues. Then comes the question, is the open preperitoneal hernioplasty technique better than the Lichtenstein open hernioplasty technique, to both the operator and to the patient?

Preperitoneal hernioplasty is a combination of open hernioplasty and laparoscopy techniques. It resembles the open hernioplasty (Lichtenstein) because the open preperitoneal also requires an incision in the inguinal region, despite the difference of location, which is 2 cm cranial from the anulus internus and the incision is made horizontally, 3 cm long. This technique is similar to laparoscopy because the open preperitoneal technique also goes inside, creates a cavity and places a mesh in the preperitoneal space. The positioning of the mesh inside the preperitoneal space requires no fixation using the tacker device as the mesh is simply placed and spread over the preperitoneal space, and the mesh shall fixate by itself due to the pressure from the peritoneum (Sinha, 2007). Post operative pain is expected to be at a minimum because the mesh is not fixated to the ligamentum inguinale and the conjoint tendons as it is done in the Lichtenstein technique (Erhan, 2008). The mesh is also not fixated using the tacker to the surrounding tissues, as it is done in the TAPP (Trans Abdominal PrePeritoneal) technique or the TEP (Totally Extra Peritoneal) technique (Pawanindra, Kajla, Chander, et al, 2004).

Not all hospitals in Indonesia is equipped with laparoscopy equipments. Even if such laparoscopic equipments are available, a certain competence and a special set of

skills are required to perform the TAPP or TEP laparoscopic techniques, moreover, the costs to be paid by the patient is higher. The patient's demand to receive minimal access surgery is also difficult to fulfill. On the contrary, the Lichtenstein open hernioplasty is simpler, although leaving a relatively longer incision scar. The surgery department of Dr. Soetomo General Hospital Surabaya had been performing laparoscopic hernia repair selectively since 2009. The data in the surgery department of Dr. Soetomo General Hospital Surabaya indicates that in 2009, from 229 herniotomy procedures performed, only 11 cases (4,80%) was laparoscopic herniotomy.

Ugahary has also performed an open preperitoneal technique, but the incisions is farther cranially from the anulus internus (Simmacher, 2000), therefore, it is more difficult to perform and require a set of special equipments, thus also demands a special set of skills to perform the technique (Veenendaal, Borst, Davids, et al, 2004). Kugel has also performed an open preperitoneal technique using a specially designed mesh, the mesh uses a ring which can be rolled and will automatically expand itself (Dogru, Girgin, Bulbuler, et al, 2006). Through the open preperitoneal hernioplasty, it is expected to have minimum incision wound, short operation time, and minimum post operative pain complaints.

Research Method

This research was an experimental prospective study, performed on private patients in several private hospitals in Surabaya between August 2010 to August 2012. This research compares the open preperitoneal hernioplasty technique and the Lichtenstein technique, performed by the same operator, to men over 18 years old of age with elective cases of reparable and unilateral lateral inguinal hernia. Patients with relapsing lateral inguinal hernia, post incarcerated lateral inguinal hernia, and those with systemic illnesses were not included in this research. If any post operative complication occurs, the sample was excluded from this research. Anesthetics was administered with both spinal or general anesthesia. The number of samples in the open preperitoneum hernioplasty group was 30 and the open Lichtenstein group 29. Samples were randomly divided into 2 groups, the open preperitoneum hernioplasty group and the open Lichtenstein group. Comparisons were made on operative incision lengths, operating time

length, and post operative pain between the two groups. Operative incision length was measured in millimeter (mm) before the final dressing of the wound at the end of the operation. The operative time length was counted in minutes, starting from the moment of the skin incision to the moment the final wound stitching was completed. Post operative pain was measured on the 4th (fourth) day after the operation using a VAS score. The antibiotic Cefotaxim 1 gram IV was administered only once, one hour before the operation, and analgetics was administered after the operation using Dynastat® 40 mg IV for only 2 administrations. Patients would go home in the following day without the use of antibiotics or analgetics and then requested to come again for a control visit on the fourth day for a VAS score assessment. The data analysis using a student t-test.

Operating technique

Open preperitoneal hernioplasty is essentially similar to TEP (Totally Extra Peritoneal) laparoscopy, but without the use of laparoscopic equipments. The incision is made 3 cm long horizontally, positioned 2 cm cranial from the anulus inguinalis internus (Pic. 2, Pic. 3). The incision is then deepened to open the aponeurosis of the musculus oblicus externus (MOE) in the direction of the fibers, then splitting the musculus oblicus internus and the musculus transversus until the preperitoneal fat is visible. By using the “peanut” and the tip of the index finger, preperitoneal fat is opened and widened until a sufficiently wide preperitoneal space is formed, allowing clear vision of the funiculus spermaticus and anulus internus structures. The space is made as large as the mesh which will be placed within (Yamac, 2008). The identification of the funiculus spermaticus together with hernial sac entering the anulus internus is performed, then hanging this structure up using a ribbon or a catheter (Pic. 4). The hernial sac is then separated carefully from the funiculus spermaticus using sharp and blunt dissection until the hernial sac is fully separated from the anulus internus (Pic. 4). A mesh the size of 15cm x 10cm in a rolled position, held by long anatomical forceps, is inserted through the incision wound into the preperitoneal space until it slightly exceeds the tuberculum pubicum, and the mesh is unrolled. This mesh shall cover the anulus internus, Hesselbach’s trigonum, and fossa ovalis all at once. The mesh will only be placed in the preperitoneal space without fixation, it is only fixated to the musculus transversus abdominis using only

one stitch to facilitate the mesh remains in place. Unlike those in the TEP or TAPP techniques which uses a tacker to fixate the mesh (Pawanindra, Kajla, Chander, et al, 2004). All the procedure performed in the preperitoneal space including the dissections, need to be done meticulously and carefully as to avoid unnecessary injuries to the peritoneum, vas deferens, and vasa testicularis (Bobby D, 2009).

RESULT AND DISCUSSION

The sample characteristics used in this research fulfills the inclusion and exclusion criteria, and both sample groups have a homogenic age distribution ($p = 0.600$). The age homogeneity test between the groups can be seen in Table 1.

Table 1: Age difference testing (years) between the groups of open preperitoneal hernioplasty dan Lichtenstein, using a t-test

<i>Var</i>	<i>Open Preperitoneum</i>			<i>Lichtenstein</i>			<i>P</i>
	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>n</i>	<i>Mean</i>	<i>SD</i>	
Age (years)	30	46.20	13.12	29	44.45	12.36	.600

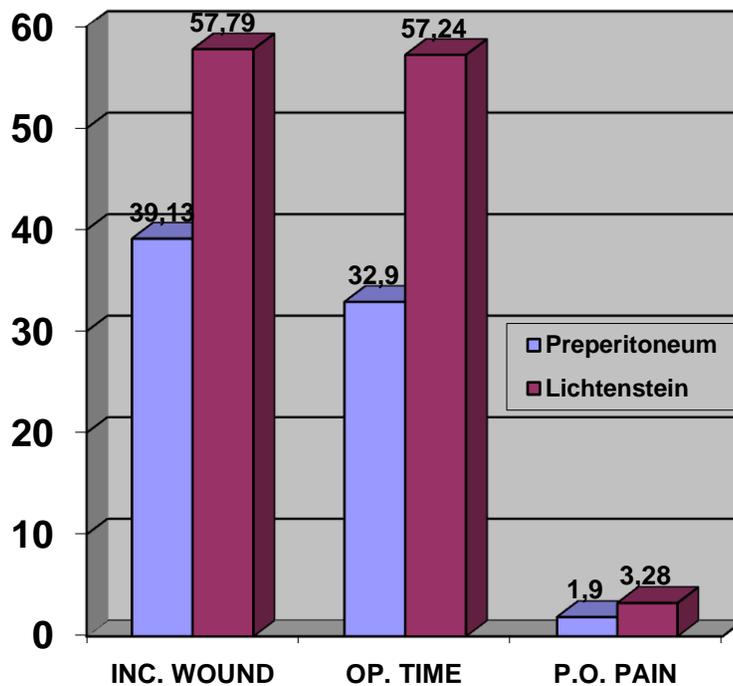
Based on the statistical testing (t-test) on the figures in Table 1, it was found that the age difference of the samples in the open preperitoneal group was at a mean of $46,20 \pm 13,12$ years old and in the Lichtenstein group was at a mean of $44,45 \pm 12,36$ years old. The numbers show no significant difference ($p=0,600$), therefore indicating that both groups have a homogenous age distribution.

The incision length in the open preperitoneal group (39.13 ± 3.01) was shorter ($P=0,000$) than those of the Lichtenstein group (57.24 ± 7.64). The length of the operation time in the open preperitoneal group ($32,90 \pm 6,73$) was shorter ($P=0,000$) than those of the Lichtenstein group (57.24 ± 7.64). By using the VAS score, post operative

pain in the open preperitoneal group ($1,90 \pm 0,71$) was smaller ($P=0,000$) than that of the Lichtenstein group (3.28 ± 0.70). (Table 2).

Table 2: Difference in incision length (mm), operation time (minute) and post operative pain (VAS Score) between the open preperitoneum and Lichtenstein technique.

	Open Preperitoneal (n=30)	Lichtenstein (n=29)	P
Incision wound length (mm)	39.13 ± 3.01	57.79 ± 1.70	.000
Operation time Length (minute)	32.90 ± 6.73	57.24 ± 7.64	.000
Post Operative Pain (VAS Score)	1.90 ± 0.71	3.28 ± 0.70	.000



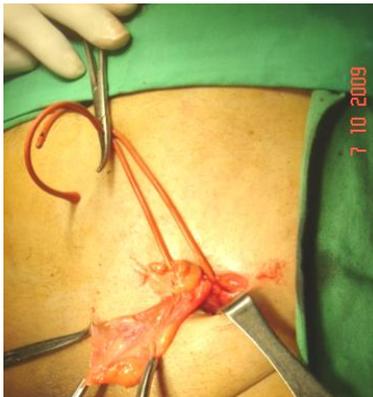
Pic.1. The incision wound (mm), operation time (minutes) and post operative pain (VAS Score) between the open preperitoneal and Lichtenstein techniques.



Pic.2. Sketch of incision plan



Pic.3. Incision wound by the end of operation, before stitching



Pic.4. Hernial sac, after separation from the canalis inguinalis



Pic.5. Incision wound after stitching

Stoppa in 1995 had also introduced the open preperitoneal approach using a wide incision to attain bigger exposure through an incision on the median line, but this was cosmetically disadvantageous due to the long incision on the abdominal median line (Bobby D, 2009). However, in cases of bilateral inguinal hernia, the operation time of the Stoppa technique was shorter than that of the Lichtenstein technique, which was 51 minutes and 65 minutes, respectively ($p < 0.01$) (Malazgirt, 2000).

The Lichtenstein technique is known to cause chronic pain (pain for more than 3 months) in an 11% rate (Shyam, 2009), causing significant morbidity after inguinal hernioplasty (Lau, 2006). Several surgery experts had tried to reduce this chronic pain by performing, among many, ileolinguinal prophylactic neurectomy, using a lightweight mesh, mesh fixation using fibrin glue sealant, or by replacing the Lichtenstein technique with laparoscopic TEP repair (Koushia, 2009)

Kugel had also performed the preperitoneal technique with a 3 cm long incision cranially from the anulus internus, with the mesh similarly placed in the preperitoneal space, but the shape of the mesh in the Kugel technique was specially designed using a stiff memory ring which was able to auto-expand after insertion into the preperitoneal space, thus eliminating the need to fixate the mesh (Dogru, Girgin, Bulbuler, et al, 2006)

CONCLUSION

Hernioplasty using the open preperitoneal hernioplasty is more beneficial than the Lichtenstein technique as it has shorter incision wound (39.13 ± 3.01 vs 57.79 ± 1.70 mm), shorter operation time (32.90 ± 6.73 vs 57.24 ± 7.64 minute) and smaller post operative pain (VAS score 1.90 ± 0.71 vs 3.28 ± 0.70).

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