Three Stitch Inguinal Hernioplasty A Novel Technique for Beginners

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Abstract

Background: Inguinal hernia is a common disease, with increasing risk of surgical repair throughout life.The main interest of surgeons has focused on the complications of mesh placement, with postoperative pain being the most significant one of them since its presence can considerably affect the life quality of the patient.

Aim: The aim of the study was to compare between mesh fixation with minimum sutures (three stitch fixations) and(Lichtenstein inguinal repair) during inguinal hernioplasty as regards to chronic post-operative pain and other post-operative complications. **Patients and Methods:** This was a prospective randomized study.40 patients were included in our studydivided into 2 groups, **Group I:** Included (20 patients), were operated with traditional method (Lichtenstein inguinal hernia repair), (control group). **Group: II:** Included (20 patients), were operated with the new technique (three stitch) mesh fixation with (2-0) prolene sutures as in Lichtenstein method but only with three stitches, (test group) between 18 and 80 years, with a unilateral primary inguinal hernia for elective surgery. All patients were subjected to hernioplasty operation; all patients were operated at Department of General surgery, Menoufia University hospital. **Results:** No statistical significant difference was present between the two groups regarding the postoperative complications. There was significant decrease in pain intensity in group II (three stitch fixations) compared with group I (Lichtenstein inguinal repair) after operation. **Conclusion**: The incidence of long-term complications of three stitch hernioplasty are comparable to that of the other standard, tension free open hernia repair. Moreover, the three stitch hernioplasty method is a simple method, easy for the beginners to adopt, has less foreign body reaction, less time consuming, causes less tissue trauma, and lesser chance for vascular injury. Further comparative studies with larger sample sizes and longer follow-up period is needed to find out the best management methodology.

Keywords: Three Stitch, Inguinal Hernioplasty, A Novel Technique, Beginners.

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Introduction:

Inguinal hernia is a common disease, with increasing risk of surgical repair throughout life **(1).**

Comprising 80–83% of all hernias 50% of inguinal hernias are indirect, 25% are direct, and 5% are femoral, 86% of all inguinal hernias are found in men, while 84% of femoral hernias are found in women (**2).**

In the beginning, meshes were used mainly for incisional hernias, but later they started to be popular also in inguinal repairs, constituting over 80% of all inguinal hernia operations in the United States today. Lichtenstein procedure is the most frequently used method among them **(3).**

Togetherwith laparoscopic repair are the most recommended approaches nowadays **(4).**

But the two methods have problems regarding to pain or costs **(5).**

The main interest of surgeons has focused on the complications of mesh placement, with postoperative pain being the most significant one of them since its presence can considerably affect the life quality of the patient. According to the recently published review study for inguinodynia following the Lichtenstein tension free hernia repair, the incidence of postoperative chronic groin pain ranges from 0 to more than 60 % **(6).**

Chronic groin pain (can be mild or moderate or severe) is defined as the presence of pain, discomfort, or hypersensitivity (not present before surgery) existing for more than 3 months after the surgery **(7).**

In order to avoid the above disadvantages, it will be proposed that polypropylene mesh be applied with less suture fixation to the surrounding tissues; the aim of our study is to compare the results of the three stitch fixation technique with mesh-fixation in traditional methods in terms of operative time, postoperative pain, recurrence rates, and other post-operative complications.

Patients and Methods

This was a prospective randomized study.40 patients were included in our study, between 18

and 80 years, with a unilateral primary inguinal hernia for elective surgery. All patients were subjected to hernioplasty operation, all patients were operated at Department of General surgery, Menoufia university hospital, and were previously devided into two groups: **Group I:** Included (20 patients), were operated with traditional method (Lichtenstein inguinal hernia repair), (control group). **Group: II:** Included (20 patients), were operated with the new technique (three stitch) mesh fixation with (2/0) prolene sutures as in Lichtenstein method but only with three stitches, (test group)

In our test group the prolene mesh was fashioned as in Lichtenstein's repair, placed and fixed only by three prolene stitches with polyproline 2.0. The first stitch was made in the periosteum of pubic tubercle, the second stitch was taken in the inguinal ligament (1.5 cm lateral to pubic tubercle), and the third stitch from the medial most part to the conjoint tendon, that was, the mesh was fixed in the medial aspect alone.

Informed consent: written informed consent was obtained from all patients.

Inclusion criteria: Patients between 18 and 80 years, patients with a primary unilateral inguinal hernia, patients in elective surgery state **and** patients who had normal laboratory tests.

Exclusion criteria: Patients more than 80 years or less than 18 years, female patients, an incarcerated or strangulated inguinal hernia, chronic obstructive pulmonary disease, ischemic heart disease, hepatic and renal patients, previous inguinal surgery, patients with immunosuppressive and collagen diseases and the impossibility of an adequate follow-up, i.e., due to psychiatric problems or travelling.

A large set of data have been recorded in the baseline characteristics, such as gender, age, side of hernia and type of complaints.

All cases included in our study were subjected preoperatively to the following: Clinical evaluation, History taking, personal, family, past history of medical diseases and history of surgical operation. Clinical examination: general and local examination. Pre-operative investigations(lab: CBC, FBS, S Urea, S Creatinine / chest x ray and ECG for patients above age of 40 years.

Methods: All the patients were admitted to hospital one day before surgery. The operation area was shaved and cleaned on the operation day. The patients were given 3rd generation cephalosporin at the time of anaesthesia induction for prophylaxis.

Anaesthesia: Spinal or general anaesthesia have been used. The choice was left up to the recommendation of the anaesthetist together with the preference of the patient. No additional inguinal block or local anaesthesia should bee used.

Operative technique: The following steps were carried out, after shaving hair at the site of operation. Betadine was the antiseptic used for skin preparation in all patients.

1. The skin was opened by parainguinal incision (half an inch above and parallel to the medial half of inguinal ligament), incised and deepened to reach the external oblique aponeurosis after ligating the three named superficial subcutaneous veins. Lichtenstein technique.
2. External oblique aponeurosis was cut opened along the direction of its fibers.
3. A plane of cleavage was created between the external oblique aponeurosis and the conjoint tendon superiorly.
4. Identification of spermatic cord and hanging it up.
5. The inguinal ligament was well defined by dissecting the floor of inguinal canal.

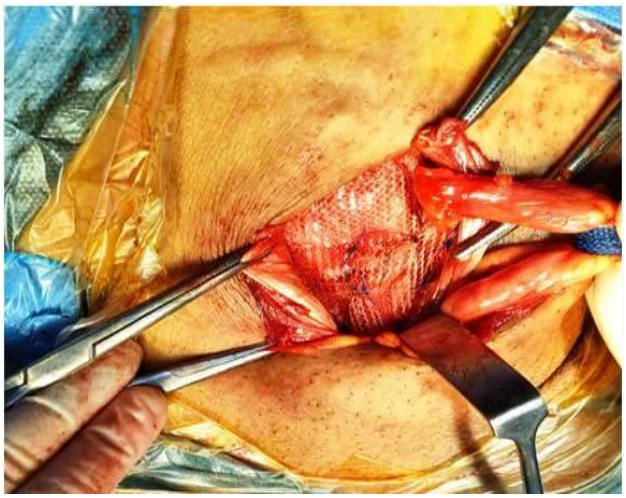

Figure (1): Mesh fixation by Lichtnechtien technique **Group: I.**

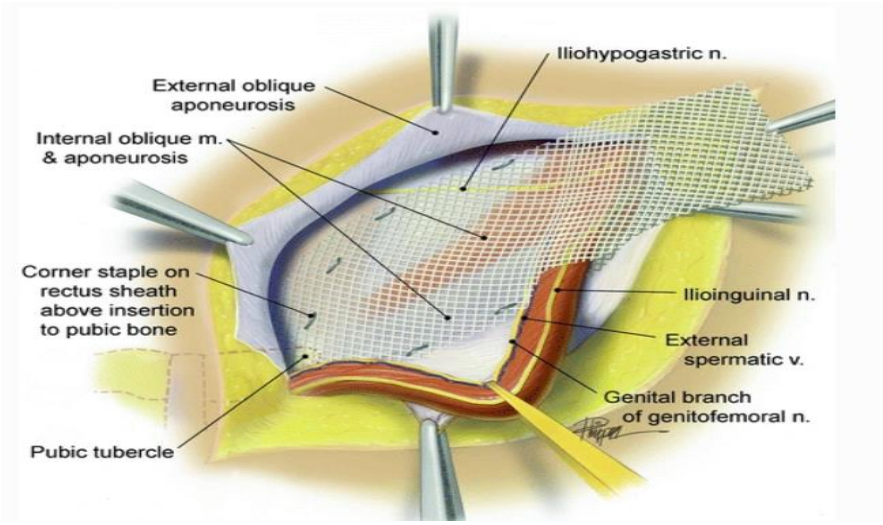

Figure (2): Lichtnechtien technique - Neuroanatomy of the left inguinal canal. Pubic tubercle on the left**Group: I(8).**

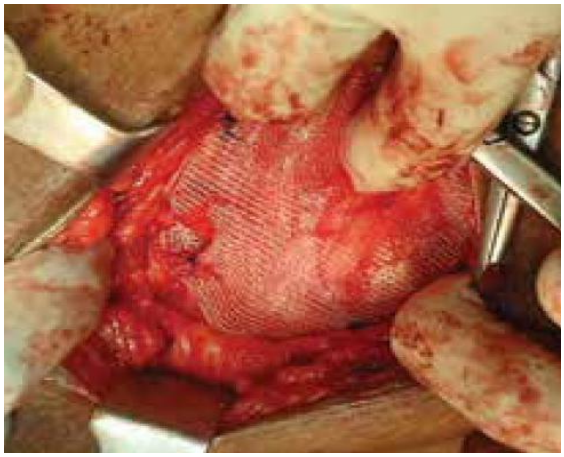

Figure (3): Mesh fixation by the new technique (three stitch mesh fixation)**Group: II.**

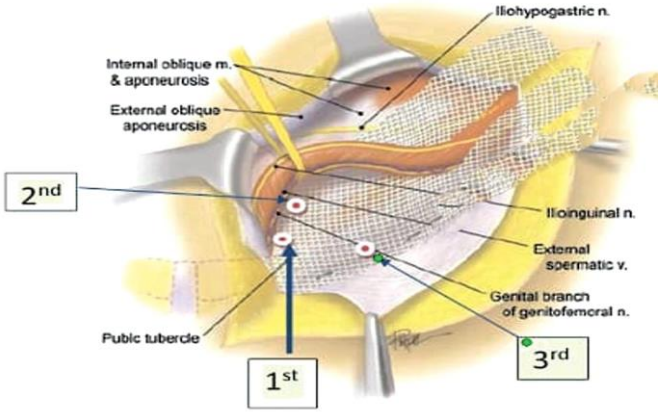

Figure (4): Three points of fixation in **Group: II (9).**

All cases included in our study were subjected postoperatively to the following: Postoperatively, the patients were treated with antibiotics as (3rd generation cephalosporins) in the 1st 24 hours, then, oral antibiotics (as) amoxicillin/clavulanic for 2 or 3 days, and analgesics was given I.M. /12 hours for one or two days then on oral analgesics after that and discharged home as soon as they feel comfortable.

Statistical Analysis: Data were collected, revised, coded, and entered into the Statistical Package for Social Science (IBM SPSS) version 23. The quantitative data were presented as mean, standard deviations. Also, qualitative variables were presented as numbers and percentages. So, the p-value was considered significant as the following: P > 0.05: Non-significant, P < 0.05: Significant, P < 0.01: Highly significant.

Results:

Both groups included 40 male patients (100 %) and 0 female patients (0%). Age of patients of Group I ranged from 27 years to 52 years at the time of operation with mean age of 37.84 ± 6.92 years. While age of patients of Group II ranged from 23 years to 62 years at time of operation with mean age of 39.08 ± 10.30 years. On clinical examination, hernias were confined to be small in 12 patients of Group I (60 %) and in 14 patients of Group II (70 %) while large hernias were present in 8 patients of Group I (40 %) and 6 patients of Group II (30 %). No statistical significance was present between the two groups regarding the demographic data of the patients. **Table (1)**

Table (1): Comparison between the two studied groups according to demographic data

	Group I **(n = 20)**		**Group** II **(n = 20)**		**Test of sig.**	**p**
	No	**%**	**No**	**%**		
Gender						
Male	20	100.0	20	100.0	0.0	1.0
Female	0	0.0	0	0.0		
Age						
Min. – Max.	27.0 – 52.0		23.0 – 62.0		t=0.447	0.658
Mean ± SD	37.84 ± 6.92		39.08 ± 10.30			
Median	37.0		40.0			

t: Student t-test $\chi 2$: Chi square test FE: Fisher Exact

p: p value for comparing between the two studied groups

No statistical significance was present between both groups regarding the features of hernias. **Table (2)**

Table (2): Comparison between the two studied groups according to different parameters

	Group I (n = 20)		**Group II (n = 20)**		$\chi 2$	**p**
	No	**%**	**No**	**%**		
Side						
Right	12	60.0	10	50.0		
Left	8	40.0	10	50.0	0.404	0.525
Bilateral	0	0.0	0	0.0		
Direct VS Indirect						
Direct	8	40.0	6	30.0	0.440	0.507
Indirect	12	60.0	14	70.0		
Type						
Inguinal	14	70.0	12	60.0	0.440	0.507
Inguinoscrotal	6	30.0	8	40.0		

$\chi 2$: Chi square test FE: Fisher Exactp: p value for comparing between the two studied groups

(Table 3) Postoperative pain after tension-free hernioplasty is the main outcome of this study. Early postoperative pain after one week ranged in Group I, no pain in 1 patient (5 %)and 5 patients (25 %) in group II, mild pain was 2 patients (10 %) in group I and 7 patients (35%) in group II, moderate pain was 14 patients (70%) in group I, while in group II was 6 patients(30%), severe pain was 3 patients in group I (15%) and 2 patients(10%) in group II .

Early postoperative pain after one week was significantly lower in Group II than Group I according to the classification of chronic pain by the International Association for the Study of Pain IASP.

Table (3): Comparison between the two studied groups according to postoperative pain in 1st week

Postoperative pain	Group I (n=20)		Group II (n=20)		χ2	MCp
	No	%	No	%		
No	1	5.0	5	25.0	8.844	0.0314
Mild	2	10.0	7	35.0		
Moderate	14	70.0	6	30.0		
Severe	3	15.0	2	10.0		

χ2: Chi square test MC: Monte Carlo
p: p value for comparing between the two studied groups

(Table 4) After 4 weeks of the operation,4 cases (20%) had no pain in Group I and in 10 cases (50%) in Group II, postoperative pain was mild in11 cases (55%) of Group I and in 10 patients (50 %) of Group II. Moderate pain occurred in 5 patients (25 %) of Group I and no patients (0 %) of Group II. Severe pain occurred in 0 patients of both Groups.

Difference of postoperative pain after 4 weeks is significantly lower in Group II than Group I according to the classification of chronic pain by the IASP.

Table (4):Comparison between the two studied groups according to postoperative pain in (4th week)

Postoperative pain	Group I (n=20)		Group II (n=20)		χ2	MCp
	No	%	No	%		
No	4	20.0	10	50.0	3.016	0.047
Mild	11	55.0	10	50.0		
Moderate	5	25.0	0	0.0		
Severe	0	0.0	0	0.0		

χ2: Chi square test MC: Monte Carlo p: p value for comparing between the two studied groups

(Table 5) After 3 months of the operation, 9 cases (45%) had no pain in Group I and in 16 cases (80%) in Group II; postoperative pain was mild 11 cases (55%) of Group I and in 4 patients (20 %) of Group II. Moderate pain occurred in 0 patients of both Groups. Severe pain occurred in 0 patients of both Groups.

Difference of postoperative pain after 3 months is significantly lower in Group II than Group I according to the classification of chronic pain by the IASP.

Table (5): Comparison between the two studied groups according to postoperative pain in (3 months)

Postoperative pain	Group I (n=20)		Group II (n=20)		χ2	MCp
	No	%	No	%		
No	9	45.0	16	80.0	4.17	0.048
Mild	11	55.0	4	20.0		
Moderate	0	0.0	0	0.0		
Severe	0	0.0	0	0.0		

χ2: Chi square test MC: Monte Carlo; p: p value for comparing between the two studied groups

(Table 6) After 6 months of the operation, 15 cases (75%) had no pain in Group I and in 20 cases (100%) in Group II; postoperative pain was mild 5 case (25%) of Group I and in 0 patients (0 %) of Group II. Moderate pain occurred in 0 patients of both Groups. Severe pain occurred in 0 patients of both Groups.

Difference of postoperative pain after 6 months is significantly lower in Group II than Group I according to the classification of chronic pain by the IASP.

Table (6): Comparison between the two studied groups according to postoperative pain in (6th months)

Postoperative pain	Group I (n=20)		Group II (n=20)		$\chi 2$	MCp
	No	%	No	%		
No	15	75.0	20	100.0	3.016	0.047
Mild	5	25.0	0	0.0		
Moderate	0	0.0	0	0.0		
Severe	0	0.0	0	0.0		

$\chi 2$: Chi square test MC: Monte Carlo
p: p value for comparing between the two studied groups

Table (7). There was no statistical significant difference between the two groups as regarding postoperative complications in group I and group II.

Table (7): Comparison between the two studied groups according to postoperative complications

Postoperative complication	Group I (n = 20)		Group II (n = 20)		$\chi 2$	MCp
	No	%	No	%		
No	16	80.0	17	85.0	1.439	0.923
Scrotal edema	1	5.0	1	5.0		
Inguinal hematoma	1	5.0	1	5.0		
Wound infection	1	5.0	1	5.0		
Hydrocele	1	5.0	0	0.0		

$\chi 2$: Chi square test MC: Monte Carlo

Discussion:

Inguinal hernia is a common disease affecting a large number of people with about 20 million surgical operations for hernia repair are performed yearly around the world **(10).**

In the present study regarding the demographic data of the studied groups, we found that both groups included 40 male patients (100 %) and 0 female patients (0%). Age of patients of Group I ranged from 27 years to 52 years at the time of operation with mean age of 37.84 ± 6.92 years. While age of patients of Group II ranged from 23 years to 62 years at time of operation with mean age of 39.08 ± 10.30 years.

In line with the current study **(11)** in their Prospective study aimed to analyze mesh fixation with minimum sutures and postoperative complications. The study enrolled 100 patients the majority of the patients fall between the age group of 40 and 60 (72%) years and all were male patients **(12)**.

Also, the study by **(13)** aimed to report the observations made in the postoperative follow up of hernia repair by three stitches hernioplasty method. The study included 100 cases of inguinal hernia. All the cases included in this study were in the age group 21 – 60 years. All the patients in this study were males only.

As well the study by **(14)** aimed to analyze the complications in inguinal hernia patients managed by three stitch hernioplasty. The study enrolled 100 cases all the cases included in their study were in the age group 21 – 60 years they were all males.

Regarding the hernia Features, we found that Inguinal hernias were on the right side in 12 patients of Group I representing 60 % of cases and 10 patients of Group II representing 50% of cases, = 55% of both groups. Left sided inguinal hernias were present in (8+10) =18 patients (45 %) of both groups. Bilateral hernias were present in 0 patients of both Groups. Direct inguinal hernias were found in 8 patients of Group I (40 %) and 6 patients of Group II (30 %). Indirect hernias were found in 12

patients of Group I (60 %) and 14 patients of Group II (70 %). On clinical examination, hernias were confined to inguinal region in confined to be small inguinal in 12 patients of Group I (30 %) and in 12 patients of Group II (70 %) while large inguinal hernias were present in 6 patients of Group I (40 %) and 6 patients of Group II (30 %).

However, the study by **(11)** reported that of the total cases, 50% were right sided, 25% were left sided, and 25% were bilateral.

As well the study by **(15)**revealed that 50% cases had right sided hernias and 25% cases had left sided hernias and 25% cases had bilateral inguinal hernias.

In the current study regarding the preoperative pain and neuropathies, we found that 2 patients of Group I (10 %) and 3 patients of Group II (15%) suffered from preoperative pain which most probably was due to the huge size of hernia. 4 patients of Group I (20 %) and 3 patients of Group II (15%) were positive neuropathy.

All of them were receiving regular medications for neuropathy in form of oral or

parenteral vitamin B. statistical significance was present between the two groups regarding the preoperative pain and neuropathies.

However, the study by **(13)**reported that common presentation was swelling in the inguino-scrotal or inguinal region 58%, pain in the inguinal region or inguino-scrotal region 16% and swelling and pain in the inguino-scrotal region 26%. Similarly, the study by **(15)** reported the same results.

In the current study regarding the Operative Details, our results showed that a classical tension-free inguinal hernioplasty was performed under spinal anesthesia in 18 patients (90 %) and 17 patients (85 %) in Group I and II, respectively. In the remaining 2 patients of Group, I and 3 patients of Group II, the hernioplasty was performed under general anesthesia. In One case was due to failure of spinal anesthesia and 4 cases requested to be operated under general anesthesia.

Literature studies showed that Surgery can be done under general or spinal anesthesia according to the patient condition and anesthetic opinion **(16)**.

Postoperative pain after tension-free hernioplasty is the main outcome of this study. Early postoperative pain after one week ranged in Group I, no pain in 1 patient (5 %)and 5 patients (25 %) in group II, mild pain was 2 patients (10 %) in group I and 7 patients (35%) in group II, moderate pain was 14 patients (70%) in group I, while in group II was 6 patients(30%), severe pain was 3 patients in group I (15%) and 2 patients(10%) in group II. Early postoperative pain after one week was significantly lower in Group II than Group I according to the classification of chronic pain by the International Association for the Study of Pain IASP.

Difference of postoperative pain after 4 weeks is significantly lower in Group II than Group I according to the classification of chronic pain by the IASP. Difference of postoperative pain after 3 months is significantly lower in Group II than Group I according to the classification of chronic pain by the IASP.Difference of postoperative pain after 6 months is significantly lower in Group II than Group I according to the classification of chronic pain by the IASP.

In our study we found that there was no statistical significant difference between the two groups as regarding postoperative complications in group I and group II.

In the study by **(11)** they reported that 2% developed chronic groin pain. VAS score was checked at 1‑ week, 1‑ month, 3 months, 6 months, 12 months, and 24 months. The two patients who had chronic groin pain at the end of 3 months had VAS score 1–3 (mild pain).

Similarly, the study by **(13)** reported that 2% patients developed chronic groin pain. Chronic groin pain is defined as, the postoperative pain which lasts for more than 3 months and contributes to significant morbidity.

However, the study by **(11)**reported that 12% were complicated with seroma, 4% had hematoma, 2% developed surgical site infection, 2% developed chronic groin pain, 1% presented with recurrence, and none developed foreign body sinus.

Which agree with Lichtenstein et al, in a study performed in 1988 the incidence of chronic groin pain is 1 to 2 per cent **(17)**

In the current study there was no statistically significant difference between the two groups as regarding intraoperative complications, operative cost, and post - operative hospital stay.

There is no recurrent cases in two groups at the time of follow up till 6 months.

The study by **(13)** reported that 2 patients developed wound infection, among the 100 patients operated. The patients were given one preoperative dose and three postoperative doses of parenteral antibiotics. The drug used for this was cefotaxime. The two patients were diabetic and they required additional antibiotics with glycaemic control. The same results were reported by **(1)**.

Conclusion:

The incidence of long-term complications of three stitch hernioplasty is comparable to that of the other standard, tension free open hernia repair. Moreover, the three stitch hernioplasty method is a simple method, easy for the beginners to adopt, has less foreign body reaction, less time consuming, causes less tissue trauma, and lesser chance for vascular injury. Further comparative studies with larger sample sizes and longer follow-up period is needed to find out the best management methodology.

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