Section: General Surgery

Original Research Article

TO COMPARE POSTOPERATIVE COMPLICATIONS BETWEEN THE TWO DIFFERENT METHODS OF INGUINAL HERNIA REPAIR: LICHTENSTEIN HERNIOPLASTY AND THREE-STITCH HERNIOPLASTY

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Abstract

Background: Lichtenstein mesh repair is commonly performed for inguinal hernias. The three-stitch hernioplasty method is easy for beginners to adopt. The present study compared the postoperative complications between Lichtenstein hernioplasty and three-stitch hernioplasty in inguinal hernia repair. **Materials and Methods:** This prospective study included 50 cases of inguinal hernia, randomly divided into 25 groups A (Lichtenstein hernioplasty) and B (three-stitch hernioplasty). Postoperative pain, postoperative complications, hospital stay, time to return to normal daily activities, chronic groin pain, and recurrence were assessed in both groups. **Result:** The average duration of surgery in Group A was 91 minutes, and for Group B patients, it was 102 minutes. This effect was statistically significant ($p < 0.05$). The average length of hospital stay for the Three Stitch Hernioplasty patients was significantly ($p<0.05$) less (3.29 days) than that for Open Lichtenstein Hernioplasty, which was 3.48 days. Postoperative pain among the patients in both groups was comparable. Although the three-stitch group patients experienced less pain, postoperative analgesia among patients in both groups at 1, 2, 3, 7, and 8 weeks was statistically insignificant. Postoperative complications after 72 hours, seven days, eight weeks and six months were insignificant ($p<0.05$) among patients in both groups. No hernia recurrence was reported in either group of patients. **Conclusion:** The study concluded that the stitch hernioplasty method showed outcomes comparable to those of Lichtenstein's standard tension-free hernioplasty.

INTRODUCTION

The Greek meaning of hernia is bulge or budding; in Latin, it is rupture or tear. The treatment of hernia has evolved since the beginning of surgical history through different stages through the times of the Greeks, Romans and Egyptians.[1] As the saying goes, the history of hernia surgery is the history of surgery. It is defined as an abnormal protrusion of the part or the whole of a viscous fluid through the wall of its cavity. More than 20 million groin hernias are repaired annually worldwide. The general approach for groin hernias is surgical repair regardless of the symptoms, as there is a risk of bowel obstruction and visceral strangulation in untreated cases.[2,3]

One of the most challenging surgical diseases to treat is inguinal hernia due to its prevalence, intricacy, and socioeconomic effects.[4] Men have a 27% likelihood, and women have a 3% chance of needing an inguinal hernia procedure over their lifetime. This was considered a significant probability. Surgery is the sole method for treating and curing inguinal hernias. There is no evidence of spontaneous recovery in adults.[5] Recurrence of inguinal hernia is inevitable, even though several surgical techniques have been attempted over the years to address the condition. A thorough understanding of the anatomy of the inguinal area allowed for the reasonable selection of the best surgical technique to improve surgical outcomes.[6]

Inguinal hernias are treated by repair on both sides in a single surgical and anaesthetic operation, with the mesh positioned on the transverse or preperitoneal fascia. A massive preperitoneal prosthesis is implanted.[7] The three stitches hernioplasty is a tension-free hernia repair that involves wrapping the prosthetic mesh around the lower part of the parietal peritoneum and placing it at the preperitoneal level

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through a Pfannenstiel incision. This technique has had particular success in repairing bilateral hernias, large scrotal hernias, and recurrent hernias, all of which are difficult to repair and have a high rate of morbidity and failure.[8]

Recently, the popularity of the tension-free Prolene mesh prosthesis repair method developed by Lichtenstein has increased. The mesh creates a mechanical barrier but does not offer any movement or a physiologically active posterior wall. In addition, there is a higher risk of infection, recurrence, chronic discomfort, testicular atrophy, and infertility following this treatment. There is also a chance of experiencing foreign body feelings and chronic groyne sepsis, which in certain circumstances may require mesh removal.[9]

Aim:

This study aimed to compare the postoperative complications of two different methods of inguinal hernia repair: Lichtenstein hernioplasty and three-stitch hernioplasty.

MATERIALS AND METHODS

This prospective observational study was performed on patients at the Department of General Surgery, GMKMCH Salem, from November 2020 to November 2022 for two years. The study included patients diagnosed with an uncomplicated inguinal hernia for whom hernia repair was deemed appropriate. The study included 50 patients who presented with uncomplicated inguinal hernia and were divided into two groups: Lichtenstein's open hernioplasty group and three-stitch hernioplasty group, each with 25 patients. The institutional ethics committee approved the study protocol. Informed written consent was obtained from all patients before inclusion in the study.

Inclusion criteria

Patients aged between 20 and 75 years with direct and indirect inguinal hernias were included in the study without any prejudice of sex. Patients with uncomplicated hernias were included in the study.

Exclusion criteria

Infants with inguinal hernias, recurrent hernias, complicated hernias, and hernias were treated laparoscopically. Pregnant patients and those with associated medical problems that contraindicated safe induction of general anaesthesia or elective surgery were excluded from the study.

Methodology:

A skin incision was created parallel to the inguinal ligament in Lichtenstein tension-free hernioplasty, extending from approximately 1/2 inches above and lateral to the pubic tubercle to approximately 1/2 inches below and medial to the anterior superior iliac spine. Vicryl 0 was used to dissect the indirect hernia sac, ligate it, and segment it. The huge direct sacs were plicated and invaded by Vicryl 2/0. A 6 × 10 cm heavy prolene mesh was utilised in each instance. Interrupted polypropylene 2/0 was used to fasten the mesh. The mesh was fastened to the inguinal ligament and conjoint tendon, beginning at the pubic tubercle and extending past the internal ring opening.[9]

In three-stitch hernioplasty, a transverse incision was made half an inch above the inguinal ligament towards the medial two-thirds and deepened. Two layers of superficial fascia, outer Camper's and inner Scarpa's fascia, are incised. The external oblique aponeurosis is identified by its shining fibres and exposed before incising. Medially, it is extended to the external ring to open it. Two leaves of the aponeurosis are elevated to visualise the conjoined tendon above and the inguinal ligament below.[8]

The ilioinguinal nerve was protected during the thorough dissection. The cremaster muscle was opened, and medial dissection was performed beyond the pubic tubercle. The hernial sac was identified and dissected using scissors or cautery. The neck of the sac was identified by its narrow area and extraperitoneal fat pad. The sac was dissected above the internal ring level, opened on the summit of the fundus, reduced, twisted, and transfixed. The redundant sac was excised for complete herniotomy. The distal part of the sac is left open in situ.

A polypropylene mesh was used for repair, and its size was determined based on the defect's width. The mesh was fixed using three Prolene stitches, starting in the pubic tubercle's periosteum, inguinal ligament, and medial most of the conjoint tendon. Haemostasis was achieved, and cord structures were placed over the mesh. The external oblique aponeurosis was sutured using polyglactin (vicryl) with continuous stitches. The wound closes in layers, and scrotal support is given.[8,10]

Each patient's operative data were recorded in the case record form, focusing on the operative time and intraoperative complications. Assessment of postoperative pain, postoperative complications, hospital stay, time to return to normal daily activities, chronic groin pain, and recurrence were all included in postoperative data collection. The visual analogue scale assessed postoperative pain in each patient at 12 h, 24 h, and seven days after surgery. After the operation, all patients were monitored for six months to assess complications, pain, return to normal daily activities, chronic groin pain, and recurrence.

Statistical analysis: The Statistical Package for the Social Sciences version 20 software (SPSS v.20.0) was used for the analysis. The significance level was set at $p = 0.05$. Numbers and percentages were used to describe the qualitative data. The range, mean, SD, and median values were used to describe the quantitative data.

RESULTS

The present study was restricted to men only to rule out variations in anatomy, which can interfere with the analysis of operative and postoperative parameters and results without sex differences. The

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majority, 16(32%), were aged 50–59. Groin swelling was reported in 45 (90%) patients, followed by discomfort on exertion in 25 (50%) [Table 1, Figure 1]. There were more right inguinal hernias, with three patients having both left and right hernias [Table 1]. 25 (50%) patients underwent Lichtenstein's tension-free Mesmeshpair, and another 25 (50%) were operated on.

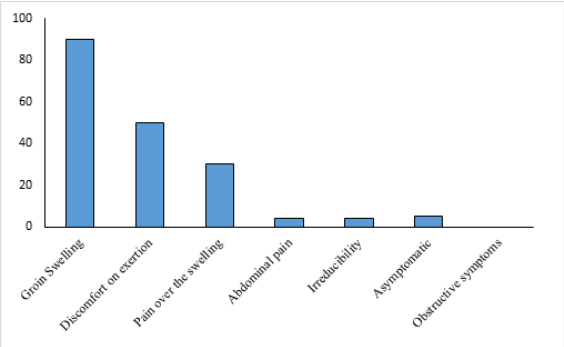

Figure 1: Observation of different presenting symptoms of all patients enrolled

The average duration of surgery in open hernioplasty was 91 min, whereas the average duration of the three-stitch hernioplasty technique was 102 min. This effect was statistically significant ($p < 0.05$). The average length of hospital stay for the Three Stitch Hernioplasty patients was significantly ($p<0.05$) less (3.29 days) than that for Open Lichtenstein Hernioplasty, which was 3.48 days. No major intraoperative complications other than routine bleeding during dissection were observed in either group. Postoperative pain among the patients in both groups was comparable. Although patients in the three-stitch group experienced less pain, postoperative analgesia in both groups at 1, 2, 3, 7, and 8 weeks was statistically insignificant [Table 2]. Postoperative complications after 72 hours, seven days, eight weeks and six months were insignificant ($p<0.05$) among patients in both groups. The major postoperative complications within three days were pain and tenderness in both groups. Seroma formation was observed in 9 and 6 patients in the Lichtenstein Hernioplasty and three Stitch hernioplasty groups, respectively. Three stitches patients complained of sore throat, and two needed drug treatment for upper respiratory tract infection postoperatively for seven days [Table 3]. No hernia recurrence was noticed between the two groups after six months and 1-year of observations for most patients. Hernia recurrence was zero at the six-month follow-up in both groups. However, four Lichtenstein Hernioplasty and seven three-stitch hernioplasty patients did not undergo annual follow-up.

The comparison of resumption of daily activities showed no major difference ($p<0.05$) between the two groups, with an average time of 1.32 days in Lichtenstein and 1.16 days in the Three stitch group. The patients who had undergone three-stitch hernioplasty returned to work earlier, with a mean of 19.80 days as compared to 20 days in patients who had undergone Lichtenstein Hernioplasty, and the difference between the two was not statistically significant ($p<0.05$) [Table 2].

Table 1: Observation of demographic variables of all enrolled patients

Parameters		**Frequency (%)**
Age Group	20-29	4 (8%)
	30-39	7 (14%)
	40-49	12 (24%)
	50-59	16 (32%)
	60-69	9 (18%)
	More than 70	2 (4%)
Gender	Male	50 (100%)
	Female	0 (0%)
Presenting symptoms	Groin swelling	45 (90%)
	Discomfort on exertion	25 (50%)
	Pain over the swelling	15 (30%)
	Abdominal pain	2 (4%)
	Irreducibility	2 (4%)
	Asymptomatic and presented for other reasons	5 (10%)
	Obstructive symptoms	0 (0%)
Side of Hernia	Right side	30(60%)
	Left side	17(34%)
	Bilateral	3 (6%)

Table 2: Observation of different evaluation variables of both group patients

		Group A (Lichtenstein hernioplasty)	**Group B (three stitches hernioplasty)**
Intraoperative complications	Bleeding- procedural	5 (20%)	2 (16%)
	Injury to blood vessels	0 (0%)	0 (0%)
	Injury to Nerves	0 (0%)	0 (0%)
	Injury to Urinary Bladder	0 (0%)	0 (0%)
	Injury to Bowel	0 (0%)	0 (0%)
	Injury to solid abdominal Organs	0 (0%)	0 (0%)
Post –operative pain/ analgesia			

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1st week	Mean value	6.44	6.32
	p-value	0.0734	0.0734
2nd week	Mean value	5.08	3.88
	p-value	0.039	0.029
3rd week	Mean value	3.92	2.68
	p-value	0.031	0.025
7th week	Mean value	3.36	2.56
	p-value	0.036	0.032
8th week	Mean value	1.04	1
	p-value	0.032	0.029
Resumption of normal activity (in days)	Mean value	1.32	1.16
	p-value	0.258	0.258
Resumption of work and productive life (in days)	Mean value	20.08	19.8
	p-value	0.0331	0.0278

Table 3: Observation of postoperative complications in patients of both groups

Parameters	**Group A (Lichtenstein hernioplasty)**				**Group B (three stitches hernioplasty)**			
	<3 days	**7 days**	**8 weeks**	**6 months**	**<3 days**	**7 days**	**8 weeks**	**6 months**
Urinary retention	5	0	0	0	0	0	0	0
Wound Soakage / Minor Hematoma	5	0	0	0	4	0	0	0
Major Bleeding	0	0	0	0	0	0	0	0
Pain/tenderness	25	10	0	0	15	2	0	0
Local swelling/ induration	15	6	0	0	8	2	0	0
Seroma	9	6	1	0	6	3	2	0
Secretion from wound	0	2	0	0	0	0	0	0
Infection, superficial	1	5	0	0	5	0	0	0
Infection, deep	0	1	0	0	0	0	2	0
Port herniation	0	0	0	0	0	0	0	0
Non-specific fever	3	2	0	0	2	0	0	0
Venous thromboembolism	0	0	0	0	0	0	0	0
Respiratory tract infections	1	0	0	0	3	0	0	0
Mortality	0	0	0	0	0	0	0	0
Total	64	32	1	0	43	7	4	0

DISCUSSION

The present study was restricted to men only; most patients (16(32%]) were between 50 and 59 years old. These findings in the present study follow those of earlier reported studies. Groin swelling was reported in 45 patients (90%), followed by exertion discomfort in 25 (50%). In our study, the right inguinal hernia was more prevalent, with three patients having both left and right hernias. Nawaz et al. reported similar findings in their investigation.[11] The average duration of surgery in Lichtenstein hernioplasty was 91 min, significantly less than the duration of the three-stitch hernioplasty technique (102 min). Patel et al., in their study, reported significantly ($p<0.05$) less mean surgery time (43.33± 7.23 min) with Stoppa's repair technique as compared to Lichtenstein's Hernioplasty (78.54± 8.51 min).[12] The average length of hospital stay for the three-stitch hernioplasty patients was significantly ($p<0.05$) less (3.29 days) than that for Open Lichtenstein Hernioplasty, which was 3.48 days. Salma et al., in their study, also reported significantly higher hospital stays than the Transabdominal Preperitoneal (TAPP) repair technique.[13]

There was no significant difference in pain between the three stitch procedures as compared to open hernioplasty until the first-week post-surgery, with a consequent lesser postoperative analgesic requirement. This was similar to many studies which compared these two techniques.[14] However, after eight weeks of follow-up, there was no major difference in pain between the groups. No significant differences in intraoperative and postoperative complications were noted. Although statistically insignificant, the number of seromas was higher in the Lichtenstein Hernioplasty group than in the three-stitch hernioplasty group. However, two patients who underwent the Lichtenstein procedure developed deep-seated infections, which required radiological investigations such as ultrasound and CT without any intervention. Persistent seromas were assumed to be responsible for this. These findings are following earlier reported studies.[15]

The time required for return to daily activities for patients undergoing three-stitch procedures was comparable to that of open inguinal hernioplasty, as in other studies. Similarly, the time required to resume productive life and return to work was comparable to that of the open hernioplasty group with three stitch procedures. These findings in the present study follow those of earlier reported studies.12 Talha et al. also reported an insignificant difference in time to return daily activity between patients with preperitoneal versus Lichtenstein tension-free hernioplasty.[16] In our study, no hernia recurrence was reported after six months and 12 months of follow-up. Pokorny et al., in their study, reported no significant difference in the recurrence of hernia for both laparoscopic versus open inguinal hernia repair surgical techniques.[17]

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CONCLUSION

The three-stitch hernioplasty method has outcomes comparable to standard Lichtenstein's tension-free hernioplasty. This method is suitable for beginners in hernial surgery. Further studies are required to confirm this procedure.

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