ORIGINAL ARTICLE

Comparative Study between Outcomes of Traditional Lichenstein and Sutureless Inguinal Mesh Hernioplasty

NEELAM WAJID, SAEED MAHMOOD, MUHAMMAD KAREEM ULLAH

ABSTRACT

Background: Inguinal hernia is one of the most common diseases requiring surgical intervention. Nowadays, the application of prolene mesh is the technique most widely used in hernia repair. Although they are simple and rapid to perform, and lower the risk of recurrence, these techniques may lead to complications.

Methods: This was a randomized controlled trial conducted at Surgical unit-I, II & III, Lahore General Hospital, Lahore. Total 300 patients were included in the study. Patients were randomly divided into 2 groups. Each group consists of 150 patients each. Those patients undergoing Lichtenstein repair was grouped as A and those undergoing suture less repair was grouped as B. Hernioplasty was done under General anesthesia.

Results: At 7th day post operative in Group-A 12 patients had hematoma while in Group-B 3 patients had Hematoma. Hematoma formation in both treatment groups at 7th day was statistically different i.e., p-value (7th Day)=0.017. In Group-B rate of hematoma formation was less as compared to Group-A. At 7th day mean pain score in Group-A was 4.6±1.3 and in Group-B was 3.5±1.0 respectively. Pain score in both treatment groups was statistically different at 1st, 2nd, 4th and at 7th day post operatively. Patients in Group-B had less pain score as compared to Group-A patients.

Conclusion: Sutureless hernia repair is a promising and superior approach as compared to Lichtenstein technique for inguinal hernia surgery in terms of postop pain and hematoma formation.

Keywords: Sutureless, Lichtenstein mesh hernioplasty, inguinal hernia, post operative pain

INTRODUCTION

Inguinal hernia is defined as abnormal protrusion of viscus or a part of viscus through a weak point in inguinal canal. Approximately 75% of all hernias occur in the groin with a lifetime risk of 7% in men and 3% in women[1]. About 2/3 of these hernias are indirect and one third direct[2]. The weakness of the abdominal wall and the increase in abdominal pressure have been regarded as the main mechanism thus chronic cough (smokers or COPD) and constipation are major risk factors for hernia[3].

Surgery is the treatment of choice varying from nylon darn, Should ice layered, Lichtenstein mesh to a laparoscopic repair. While numerous surgical approaches exist to treat inguinal hernias, the Lichtenstein tension-free mesh-based repair remains the criterion standard for primary hernia. In a Cochrane review comparing mesh to non-mesh open repair, it was found that former has low rate of recurrence, almost quarter of those of latter. Laparoscopic repair is suggested for recurrent and bilateral inguinal hernias, though it may also be offered for primary inguinal hernia repair, have certain technical limitations including surgeon's expertise[1,4].

Department of Surgery, Lahore General Hospital/PGMI, Lahore
Correspondence to Dr. Saeed Mahmood, Assistant Professor Email: saeed.mahmood.lgh@gmail.com cell 0334-4231696

Two techniques have been described to use a mesh in open procedure i.e., sutured (traditional Lichtenstein) and suture less. Those advocating suture less mesh hernioplasty, are of the opinion that decrease tension in suture line and a better leveling leads to rapid embodiment of mesh without formation of dead space therefore chances of nerve entrapment and post operative complications are reduced, so that post operative recovery and post operative hospital stay will be decreased. On the other hand some studies claim that chances of displacement, migration and folding of mesh are more in suture less mesh hernioplasty than traditional Lichtenstein technique, resulting in the failure of the whole procedure[5,6,7,8,9].

One study reported earlier in 2011 reported that pain with suture less technique was 2.5±1.7 while with Lichtenstein was 3.2±1.8 and hematoma was present in 1.7% cases with suture less technique while in 8.2% with Lichtenstein technique. There was significant difference between both study groups for both outcome variables[10]. But another study conducted in 2012 reported that there is significant difference between both groups for intensity of pain [2.2±1.0 with suture less vs. 4.0±1.1 with Lichtenstein technique] but hematoma was found to be insignificantly different in both groups [1.4% with suture less vs. 3.9% with Lichtenstein technique][11].

Rationale of the present study is to compare the outcome of Lichtenstein vs. suture less inguinal hernioplasty in patients with inguinal hernia. Literature is evident that suture less technique is better than Lichtenstein hernioplasty but there is also controversy in results. Because of this ambiguity mostly surgeons prefer Lichtenstein hernioplasty for inguinal hernia repair. Through this study we want to confirm that which technique is better so that in future we will use better technique that will improve our practice and will help to reduce complications. This will also help to reduce burden of hospital and surgeons.

MATERIALS AND METHODS

This study was conducted at the Department of Surgery, Lahore General Hospital, Lahore from May 2011 to May 2012. In this Descriptive case series, 300 patients were selected by non probability, consecutive sampling. All patients aged 20-80 years of either gender, with clinically reducible inguinal hernia, diagnosed on clinical examination.

After approval from hospital ethical committee, 300 patients fulfilling the inclusion criteria was selected from inpatient department of the hospital. Informed consent from each patient was taken. Their demographic information like name, age, gender was recorded. Patients were divided into 2 groups randomly by using lottery method. Those undergoing Lichtenstein repair was grouped as A and those undergoing suture less repair was grouped as B. Hernioplasty was done under General anesthesia by same consultant and all surgeries were performed by a single surgical team. Patients were followed by researcher himself at 7th postop day for assessment of hematoma and pain (as per operational definition).

Statistical analysis of data was done using SPSS-12. Mean and Standard deviation was calculated for age and pain. Frequency and percentages was determined for qualitative variables i.e. gender and hematoma. Chi square test was used to compare the hematoma in both groups while t-test was used to compare mean pain score in both groups. p-value $\leq$ 0.05 was considered as significant.

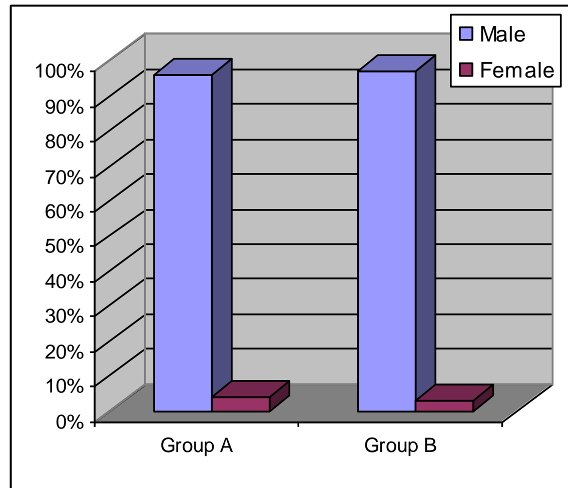
RESULTS

Table 1: Age distribution

	Group-A	Group-B	Total
N	150	150	300
Mean±SD	45.46±7.62	43.81±7.78	44.64±7.73
Minimum	20.00	21.00	20
Maximum	60.00	60.00	60

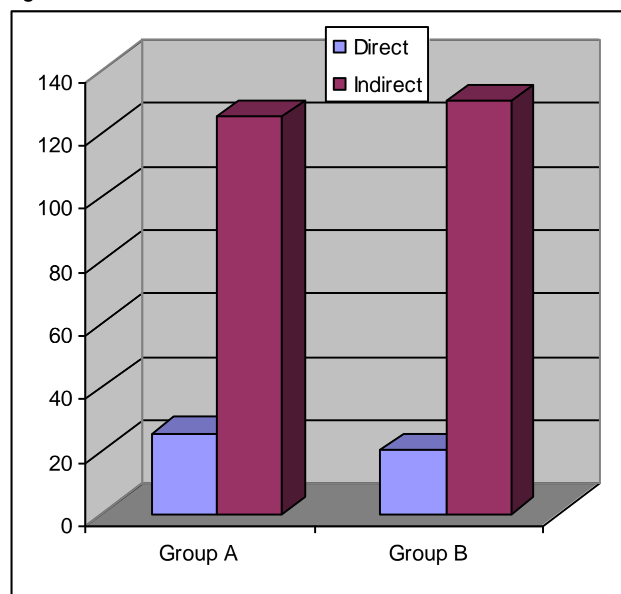
While mean age patients in Group-A and Group-B was 45.46±7.62 and 43.81±7.78 years respectively (Table 1).

Fig. 1:



In Group-A there were 144(96%) male and 6(4%) female patients. Whereas in Group-A 145(96.7) patients were male and 5(3.3) were female (Fig. 1).

Fig. 2:



In Group-A there were 144(96%) male and 6(4%) female patients. Whereas in Group-A 145(96.7) patients were male and 5(3.3) were female (Fig. 2). Type of Inguinal hernia shows that in Group-A 25(16.7%) patients had direct and 125(83.3%) had indirect hernia. In Group-B 20(13.3%) patients had direct and 130(86.7%) had indirect herni (Fig. 2).

Hematoma formation was assessed in both treatment groups post operatively. Patients were followed at 1st, 2nd, 4th and at 7th day to see hematoma formation in both treatment groups. At 1st and 2nd day no patient in Group-A and 2 patients in Group-B had hematoma. At 4th day no patient in Group-A and 3 patients in Group-B had hematoma. Hematoma formation was statistically same in both treatment group at 1st, 2nd and at 4th day respectively. i.e., [p-value (1st & 2nd Day)=0.156, p-value (4th Day)=0.082] At 7th day post operative in Group-A 12 patients had hematoma while in Group-B 3 patients had Hematoma. Hematoma formation in both treatment groups at 7th day was statistically different. i.e., p-value (7th Day)=0.017 In Group-B rate of hematoma formation was less as compared to Group-A (Table 2)

Post operative pain was assessed in both treatment groups. Patients were followed at 1st, 2nd, 4th and at 7th day to see pain status in patients in treatment groups. Pain was assessed by using visual analogue scale. At 1st day mean pain score in Group-A and -B was 7.1±2.3 and 5.8±1.9. Mean pain score at 2nd day in Group-A and B was 6.5±1.8 and 5.1±1.5. At 4th day mean pain score in Group-A was 5.1±1.6 and in Group-B was 4.3±1.3. At 7th Day mean pain score in Group-A was 4.6±1.3 and in Group-B was 3.5±1.0 respectively. Pain score in both treatment groups was statistically different at 1st, 2nd, 4th and at 7th day post operatively. Patients in Group-B had less pain score as compared to Group-A patients. i.e., [p-value (1st & 2nd Day)=0.000, p-value (4th & 7th day)=0.000] (Table 3)

Hematoma formation in both treatment groups was stratified in relation to direct and indirect hernia type. There were total 45 patients who had direct inguinal hernia. Among them 25 were in Group-A and 20 were in Group-B. At 1st, 2nd and at 4th day none of the patients in both treatment groups had hematoma. While at 7th day only 1 patient had hematoma formation in Group-A while in Group-B no patient had hematoma. There were 253 patients who had indirect hematoma. Among these patients 125 were in Group-A and 128 were in Group-B. At 1st 2nd and 4th day no patient had hematoma in Group-A while at 7th day 11(8.8%) patients had hematoma in Group-A. In Group-B there were only 2 patients who had hematoma formation at day 1st and 2nd. While at 4th and 7th day only 3 patients had hematoma. According to p-value rate of hematoma formation was statistically same in both treatment groups at 1st, 2nd, 4th and at 7th day postop respectively (Table 4).

Table 2:

	Group A	Group B	P value
Day 1			
Yes	0	2(1.3%)	0.156
No	150(100%)	148(98.7%)	
Day 2			
Yes	0	2(1.3%)	0.156
No	150(100%)	148(98.7%)	
Day 4			
Yes	0	3(2%)	0.082
No	150(100%)	147(98%)	
Day 7			
Yes	12(8%)	3(2%)	0.017
No	138(92%)	147(98%)	

Table 3

	Group A	Group B	P value
Pain at day 1			
Mean	7.1	5.8	0.000
SD	2.3	1.9	
Pain at Day 2			
Mean	6.6	5.1	0.000
SD	1.6	1.3	
Pain at day 4			
Mean	5.1	4.3	0.000
SD			
Pain at day 7			
Mean	4.6	3.5	0.000
SD	1.3	1.0	

Table 4: Hematoma formation at Day1,2,4, & 7 postoperative in treatment group

Hematoma	Direct		P value	Indirect		P value
	Group A	Group B		Group A	Group B	
Day 1						
Yes	0	0		0	2(1.56%)	
No	25(100%)	20(100%)		125(100%)	128(98.44%)	0.164
Day 2						
Yes	0	0		0	2(1.56%)	0.164
No	25(100%)	20(100%)		0	2(1.56%)	
Day 4						
Yes	0	0	-	0	3(2.30%)	0.088
No	25(100%)	20(100%)		125(100%)	127(97.70%)	
Day 7						
Yes	1(4%)	0	0.366	11(8.8%)	3(2.30%)	0.023
No	24(96%)	20(100%)		114(91.2%)	127(97.70%)	

DISCUSSION

The increasing use of mesh procedures in inguinal hernia surgery has led to a substantial decrease in the incidence of hernia recurrence. As a result, surgeons (and, increasingly, their patients) are now focused on other measures reflecting the success of hernia repair. The prevalence of postoperative pain syndromes after open and laparoscopic procedures has been reported to be as high as 30%, and some analyses estimate that 12% of patients feel themselves to be restricted in their daily activities because of pain. Clinical studies have shown that both recurrence and chronic pain after hernia repair are influenced by the type of mesh implanted and its method of fixation. The ideal mesh fixation should produce no structural damage and be biocompatible in order to reduce the risk of hematoma and seroma. Conventionally, the mesh prosthesis is secured by either sutures or staples. Despite the ‘‘tension-free’’ nature of these hernioplasties, sutures and staples may strangulate muscle fibers, compress regional nerves, or give rise to a lesion, leading to incapacitating pain or dysesthesia.(106-115)

Nowadays, mesh repair has become the gold standard for hernia repair, assuring excellent repair results and a low recurrence rate. According to the international literature, pain (both early and late onset) is an important and frequent complication of hernia surgery, causing varying degrees of discomfort to the patient. McGrath states that 30% of patients ascribe some degree of post-operative pain to discharge delay, while Al Weri reports that post-operative chronic pain is still present in 9.7% after 6 months and in 4.1% of cases after 1 year. Indeed, chronic post herniorrhaphy groin pain is defined as a persistent postoperative pain that fails to resolve 3 months after surgery, and can lead to depression and inability to work[14-27].

In this study Hematoma formation in both treatment groups at 7th day was statistically different. i.e. p-value (7th Day)=0.017 In Group-B (Suture-less Henrioplasty) rate of hematoma formation was less as compared to Group-A (Lichtenstein Hernioplasty). At 7th day mean pain score in Group-A (Lichtenstein Hernioplasty) was 4.6±1.3 and in Group-B (Suture-less Hernioplasty) was 3.5±1.0 respectively. Pain score in both treatment groups was statistically different at 1st, 2nd, 4th and at 7th day post operatively. Patients in Group-B had less pain score as compared to Group-A patients. i.e., [p-value (1st & 2nd Day)=0.000, p-value (4th & 7th day Day)=0.000]. Lionetti in his study compared the suture less hernioplasty with Lichtenstein hernioplasty. He reported that average VAS scores were significantly lower in suture less hernioplasty than in Lichtenstein hernioplasty. [2.2±1.0 vs. 4.0±1.1] but hematoma was found to be insignificantly different in both groups [1.4% vs. 3.9%][11].

Negro and his team study reported earlier in 2011 that pain with suture less technique was 2.5±1.7 while with Lichtenstein was 3.2±1.8 and hematoma was present in 1.7% cases with suture less technique while in 8.2% with Lichtenstein technique. There was significant difference between both study groups for both outcome variables[10].

Results of this study is comparable to the studies of Negro and Lionetti. Hematoma formation at 7th day in Lichtenstein technique group was 8% while in suture less hematoma formation was 3% only. This difference was statistically significant. Similarly pain score at 7th day post operative was less in suture less group as compared to Lichtenstein technique. i.e., (3.5±1.0 vs. 4.6±1.3). Although the Lichtenstein hernia repair is a tension-free method, pain may originate from nerve resection, a periostal reaction, tension on muscle fibers, nerve compression due to the sutures, or a foreign-body reaction caused by the mesh itself. One method to reduce postoperative pain was thought to be the use of a sutureless technique[13,28,29,30,31,21].

Hidalgo et al. and Nowosbilski et al. showing less pain after sutureless Lichtenstein hernia repair compared to the sutured technique. Results of this study in terms of post operative pain and hematoma formation is in accordance with studies mentioned above. Almost all authors advocating and showing evident results for suture less technique[14,29].

Lichtenstein hernia repair is well known, safe, easy to teach and has a low morbidity and mortality rate. Nevertheless, several authors have recently published high percentages of postoperative discomfort and chronic pain. In this study it was shown that a modified sutureless alternative is superior to the sutured technique. The sutureless technique tends to result in less pain. Therefore it is sensible to use the sutureless technique for patients prone to pain[12,28,33,34,35,36,37,38,39].

CONCLUSION

According to the results of this study suture less hernia repair is a superior approach as compared to Lichtenstein technique for inguinal hernia surgery in terms of post operative Hematoma formation (8%: Lichtenstein Hernioplasty Vs 2% Suture-less Hernioplasty) and pain status (4.6±1.3: Lichtenstein Hernioplasty Vs 3.5±1.0 Suture-less Hernioplasty). Suture-less technique is effective and should be considered as first line of option as compared to Lichtenstein hernioplasty.

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