

## A COMPARATIVE STUDY IN HERNIOPLASTY WITH AND WITHOUT DRAIN AND THE ASSOCIATED COMPLICATIONS

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### ABSTRACT

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#### BACKGROUND

The present study is a comparative study to compare in Lichtenstein's mesh repair, the need of a subcutaneous suction drain in inguinal hernias at Government General Hospital, Guntur. To study the advantages and disadvantages of using subcutaneous suction drain in Lichtenstein's hernioplasty.

#### MATERIALS AND METHODS

In the present study, out of 50 patients, 32% of patients who had undergone drainage group complained of pain and 8% of patients who had undergone non-drainage complained of pain. In our study, 0% and 4% of patients developed haematoma in drainage and non-drainage group, respectively. 12% of patients in drainage group developed seroma and 12% of patients in non-drainage group developed seroma. In the present study, 16% of cases in drainage and 20% in non-drainage group. In the present study, patients in drainage group mean postoperative hospital stay is 9.1 days and in non-drainage group is 6.7 days. The average duration of postoperative hospital stay in patients of drainage group is higher than in non-drainage group with the above results, the early postoperative complications like pain, mean postoperative stay in hospital are increased in Lichtenstein's with drainage group. The early postoperative complications like seroma, haematoma and wound infection rates are similar in both drainage and non-drainage groups. So, it appears that suction drain usage can be restricted in Lichtenstein's tension free mesh repair in simple inguinal hernias unless the hernia is complicated or there is extensive dissection.

#### RESULTS

The details of all the (50) cases were drawn as master chart with regard of relevance. Statistical analysis was done using Epi info version 3.5.3. P value is calculated using Chi-square test.

#### CONCLUSION

In the present study, 50 patients with inguinal hernia who had undergone Lichtenstein's hernioplasty with subcutaneous suction drain are compared with those who had undergone Lichtenstein's hernioplasty without drain.

#### KEYWORDS

Lichtenstein's Mesh Repair, Pain, Seroma, Haematoma, Wound Infection.

**HOW TO CITE THIS ARTICLE:** Amruthavalli BV, Naik MB. A comparative study in hernioplasty with and without drain and the associated complications. J. Evid. Based Med. Healthc. 2017; 4(22), 1266-1271. DOI: 10.18410/jebmh/2017/247

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#### BACKGROUND

This study was conducted to evaluate the role of subcutaneous suction drain in Lichtenstein's hernioplasty and the associated complications. The present study is a comparative study to compare in Lichtenstein's mesh repair the need of a subcutaneous suction drain in inguinal hernias at Government General Hospital, Guntur. To study the advantages and disadvantages of using subcutaneous suction drain in Lichtenstein's hernioplasty in terms of complications like pain, seroma, haematoma, wound infection and mean postoperative stay in hospital.

*Financial or Other, Competing Interest: None.*

*Submission 16-02-2017, Peer Review 27-02-2017,*

*Acceptance 04-03-2017, Published 14-03-2017.*

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*DOI: 10.18410/jebmh/2017/247*



#### MATERIALS AND METHODS

Patients admitted in the General Surgical Units of Government General Hospital, Guntur, A.P., during the period of November 2012 to September 2014. Total number of patients admitted during this period at various surgical units with complaints of inguinal hernia are 250. Every fifth patient is included for the study (Example 1, 5, 10, 15, 20). This is a prospective study comprising of 50 patients of inguinal hernia over a period of 23 months from November 2012 to September 2014.

In the present study, 32% of patients who had undergone drainage group complained of pain and 8% of patients who had undergone non-drainage complained of pain. In our study, 0% and 4% of patients developed haematoma in drainage and non-drainage group, respectively. 12% of patients in drainage group developed seroma and 12% of patients in non-drainage group developed seroma in the present study 16% of cases in drainage and 20% in non-drainage group. In the present study, patients in drainage group mean postoperative

hospital stay is 9.1 days and in non-drainage group is 6.7 days. The average duration of postoperative hospital stay in patients of drainage group is higher than in non-drainage group with the above results, the early postoperative complications like pain, mean postoperative stay in hospital are increased in Lichtenstein's with drainage group. The early postoperative complications like seroma, haematoma, wound infection rates are similar in both drainage and non-drainage groups. So, it appears that suction drain usage can be restricted in Lichtenstein's tension free mesh repair in simple inguinal hernias unless the hernia is complicated or there is extensive dissection.

### Aims and Objectives

A comparative study in hernioplasty with and without drain and the associated complications.

### Method of Collection of Data

#### Inclusion Criteria

Out of 250 patients with complaints of inguinal hernia who required repair coming to the Surgical Outpatient Department at Government General Hospital, Guntur, and every 5<sup>th</sup> patient was selected.

#### Exclusion Criteria

Patients presenting with congenital inguinal hernia and complicated inguinal hernias.

Investigation diagnosis was based on clinical findings. Investigations were done to assess the fitness of patients for surgery.

1. Routine blood investigations- Hb%, BT, CT.
2. Fasting blood sugar, postprandial blood sugar.
3. Blood urea, serum creatinine.
4. Electrocardiogram.
5. Chest radiography.
6. Abdominopelvic ultrasound.

If the patients were found to have any complicating medical conditions like diabetes mellitus, hypertension, ischaemic heart disease and COPD were treated for the condition first and re-assessed for fitness for surgery.

Patients were operated by Lichtenstein's methods based on tension free and mesh based under spinal anaesthesia.

### Operative Technique

A transverse skin crease incision is deepened down to the external oblique aponeurosis. The spermatic cord is mobilised in the usual way. Direct sacs are inverted and imbricated using a non-absorbable suture to flatten the posterior wall. Indirect sacs are dissected from the cord up to extraperitoneal fat and then either excised or inverted. High dissection rather than high ligation is the important feature of this stage. If deep ring is widened (Gilbert classification 2 or 3), a cone of mesh is inserted and anchored usually superiolaterally and sometimes inferiorly to the inguinal ligament by two or three non-absorbable sutures. Inguinoscrotal sacs are transacted in the canal and the proximal portion closed, whereas the mouth of distal

portion is left undissected, but wide open. Intraoperatively, at the end of meticulous haemostasis and prior to wound closure, patients are randomised by sealed, covered envelope to two groups either to insert a subcutaneous suction drain or not. Based on that, they are divided into drainage group (LT+D) and non-drainage group (LT-D). If drain is used. it is brought out through a separate stab incision, but not through the main incision. All patients were given preoperative prophylaxis with Inj. Cefotaxime 1 g IV once at the induction of anaesthesia.

Postoperatively, Inj. Diclofenac 75 mg IM, BD was given as analgesia for 48 hours to both the groups. Postoperatively, Inj. Cefotaxime 1 g IV, BD was given for 48 hours to both the groups. Postoperatively, patients were evaluated for the following complications-

- Pain - (persistent pain even after 48 hours of analgesic treatment is considered as significant pain.) treated by Inj. Tramadol IM where relevant.
- Haematoma - Evacuated when required.
- Seroma - Aspirated where relevant.
- Wound Infection - Confirmed by culture and sensitivity and treated by drainage and appropriate antibiotics.
- Postoperative duration of stay in the hospital.
- Patients were discharged when considered fit. Sutures were removed on 7th day postoperatively.
- Daily recordings of output of drain is recorded.
- If drain is used, it is removed when the output of drain was less than 50 mL per day irrespective of the postoperative day.
- Patients are followed up for a period of 6 weeks postoperatively.

Statistical analysis was done using Epi info version 3.5.3. P value was calculated using Chi-square.

### OBSERVATION AND RESULTS

The details of all the (50) cases were drawn as master chart with regard of relevance. Statistical analysis was done using Epi info version 3.5.3. P value is calculated using Chi-square test. All the cases were analysed and the results of the study were as follows-

Age Group (Years)	Number of Cases	Percentage
10-20	1	2%
21-30	8	16%
31-40	8	16%
41-50	10	20%
51-60	15	30%
61-70	7	14%
70-80	1	2%

**Table 1. Age Incidence**

The age of the patients ranged between 18 years and 80 years. In the present study, 2% of patients were between 10-20 years, 16% of patients were between 21-30 years, 16% of patients were between 31-40 years, 20% between 41-50 years, 30% between 51-60 years, 14% were between 61-70 years and 2% of patients were between 70-80 years.

In the study, maximum number of patients presented between 50 and 60 years of age.

Sex	Number of Cases	Percentage
Male	50	100%
Female	0	0%

**Table 2. Sex**

Over the period of study, only male patients presented with inguinal hernia.

Type	Number of Cases	Percentage
Direct	21	42%
Indirect	29	58%
Both	0	0%

**Table 3. Type of Hernia**

## Postoperative Complications

### 1) Comparison

Type	No. of Patients c/o Pain	No. of Patients without Significant Pain	No. of Patients in Each Group	% of Patients with Pain
Drainage group	8	17	25	32%
Non-drainage group	2	23	25	8%

**Table 5. Pain**

In the present study, 32% of patients who had undergone drainage group complained of pain and 8% of patients who had undergone non-drainage complained of pain.

Chi-square - 4.50.

p-value was found to be statistically significant (0.03).

### 2) Haematoma

Type	No. of Patients Developing Haematoma	No. of Patients Without Haematoma	No. of Patients in Each Group	% of Patients without Haematoma
Drainage group	0	25	25	0%
Non-drainage group	1	24	25	4%

**Table 6. Haematoma**

In our study, 0% and 4% of patients developed haematoma in drainage and non-drainage group, respectively. The difference was statistically insignificant (p-value >0.05).

### 3) Seroma

Type	No. of Patients Presenting with Seroma	No. of Patients Without Seroma	No. of Patients in Each Group	% of Patients with Seroma
Drainage group	3	22	25	12%
Non-drainage group	3	22	25	12%

**Table 7. Seroma**

In the present study, 12% of patients in drainage group developed seroma and 12% of patients in non-drainage group developed seroma.

Here, the p-value was found to be insignificant.

### 4) Infection

Type	No. of Patients with Infection	No. of Patients Without Infection	No. of Patients in Each Group	% of Patients With Wound Infection
Drainage group	4	21	25	16%
Non-drainage group	5	20	25	20%

**Table 8. Infection**

In the present study, 42% cases were of direct type and 58% cases were of indirect type and both were 0%.

Location	Number of Patients	Percentage
Right	28	56%
Left	22	44%
Bilateral	0	0

**Table 4. Location of Hernia**

In the present study, 56% of cases had right-sided hernias, 44% had left-sided.

In the present study, 16% of cases in drainage and 20% in non-drainage group.

### 5) Duration of Hospital Stay

Stay in Days	Drainage Group	Non-Drainage Group
Average hospital stay	9.1	6.7

**Table 9. Average Number of Days of Hospital Stay**

In the present study, patients in drainage group, mean postoperative hospital stay is 9.1 days and in non-drainage group is 6.7 days.

### DISCUSSION

The use of drains in elective surgery appears to be a never-ending story. The increasing use of minimally-invasive techniques for hernia repair has raised new interest in reducing discomfort after open hernia repair. Such discomfort, in part maybe, due to insertion of drains into wound area. Another though slightly minor issue is the need for drains with regard to treatment cost. Finally, drains may be undesirable when surgery is to be performed as an outpatient procedure. On the other hand, all of us recall patients with large and unpleasant seromas and haematomas following hernia repair. Such seromas and haematomas may cause considerable discomfort to the patient and embarrassment to the surgeon.

#### The Objectives of the Study were-

1. To study the in-hospital morbidity in terms of postoperative complication rates following Lichtenstein hernioplasty with and without subcutaneous suction drain.
2. To compare the above results and come to a conclusion regarding the best of the above two procedures.

#### Age at Presentation

In a study by Bholla Singh Sidhu et al (1996),<sup>1</sup> the following were their findings regarding the age at presentation of inguinal hernias. It is compared with the present study findings.

Age Group (Years)	Present Study Percentage	Bholla Singh Group Percentage
10-20	2	-
21-30	16	12
31-40	16	28
41-50	20	20
51-60	30	8
61-70	14	24
71-80	2	8

**Table 10. Age at Presentation**

In the Bholla Singh study, the incidence was highest in 31-40 years age group and 40% were above 50 years of age group. In the study by Ira, highest numbers of cases (30%) were >65 years of age group and next % of were in the age group of 15-44 years.

In the present study, 16% of patients were between 21-30 years, 16% of patients were between 31-40 years, 20% between 41-50 years, 30% between 51-60 years and 14% were between 61-70 years. These results are comparable with the other studies.

In a study by Ira, 18% of cases were >15 years of age, 29% of cases were 15-44 years of age, 23% were 45-64 years and 30% of cases were above 65 years of age (Ira M Rutkow, 1998).

#### Sex Distribution

- In a study by Ira Rutkow, 90% of inguinal hernias were in males and 10% of cases were in females (Ira M Rutkow, 1998).<sup>2</sup>
- In a study by Faish, 95% of total inguinal hernia cases were in males and 5% were in females (T. Faish et al 2000).<sup>3</sup>
- In a study by John W Murphy, 91.3% of inguinal hernias were in males and 8.7% were in females (John W Murphy, 2001).<sup>4</sup>
- In this study, however, there were no cases of inguinal hernias in females recorded. This may be due to short study period and the sample size being too small.

Type	Palanivelu Study	R.H.R. Study	Mayo Clinic Series	Present Study
Direct	122 (24%)	349 (37%)	21.8%	42%
Indirect	386 (76%)	595 (63%)	61.8%	58%
Both	0%	0%	10.4%	0%

**Table 11. Type of Hernia**

The above table shows the numbers and percentages of direct and indirect hernias in three previous studies and the present study.

Indirect hernia constituted 76% in a study by Palanivelu (C. Palanivelu et al 2000)<sup>5</sup> and 63% in the study of Robb (Robb H Rutledge 1988).<sup>6</sup>

The results of the present study are comparable with the previous studies.

#### Location of Hernia

As can be expected, the incidence of hernia is more common on the right side owing to the embryological fact the right testis descends later than the left and higher incidence of patent processus vaginalis on the right side.

The following table compares the findings of the present study with previous three studies.

#### Type of Present Study

Location	Bholla Singh Sidhu et al (1999)	Bahadir Kulah et al (2001) <sup>7</sup>	Mayo Clinic Series	Present Series
Right	60%	63%	57.5%	56%
Left	36%	37%	32%	44%
Bilateral	4%	-	10.5%	0

**Table 12. Location of Hernia**

The above compilation shows that the present study is consistent with the previous three studies.

### Pain

Residual neuralgia following Lichtenstein's hernioplasty represents the most vexing complication in the inguinal region. In some cases, the postoperative pain can be debilitating requiring re-exploration and division of the nerves. In the present study, only immediate postoperative pain was evaluated. 32% of patients in drainage group complained of pain, whereas 8% of patients complained of pain in the non-drainage group. P value being less than 0.05, the difference was significant. In a study conducted by Sobhiyeh Mohammed<sup>8</sup> et al (2011) showed that there was no significant difference in pain following Lichtenstein's mesh hernioplasty with and without drains (95% vs. 90%). Here, the p-value was not significant. The significantly higher percentage of patients complaining of pain in the present study maybe due to the pain, which accompanies any surgery (no scoring system was used to quantify pain and only complaint by the patient was taken into consideration) and individual variation with threshold level of pain.

### Haematoma

Bleeding from either artery or vein may result at all anatomic levels during an inguinal repair resulting in haematoma formation. In our study, 0% and 4% of patients developed haematoma in drainage and non-drainage group, respectively. The difference was insignificant statistically (P value >0.05). In a study by Rahim Mahmudlu<sup>9</sup> et al (2011), 9.7% of all patients developed haematoma. In drainage group compared to 3.4% in the non-drainage group, no significant statistical difference was observed in two compared groups (total 60 patients 31 with drain and 29 without drain) M. P. Simsons<sup>10</sup> et al (2009), it is recommended that wound drains are only used where indicated (much blood loss, coagulopathies).

### Seroma

Seroma represent exudates (e.g. solutes, water, plasma proteins including fibrin and neutrophils). Seroma results from the trauma of scalpel, scissors, cautery and foreign bodies. In the present study, 12% of patients in the drainage group developed seroma and 12% of patients in the non-drainage group developed seroma. Here, the p-value was found to be insignificant, i.e. greater than 0.05. In a study by Rahim Mahmudlu et al (2011) in 3.2% of patients developed seromas in drainage group versus 0% in the non-drainage group and no significant statistical difference was observed. In another study conducted by Aachen group 11 (1997) found that out of 100 patients randomised by envelope method into drainage and non-drainage group significant subcutaneous fluid collections were observed in 30% patients in non-drainage group compared with 4% patients in drainage group. Studies concerning postoperative drainage to prevent seromas are contradictory. In two RCTs

of patients following open intervention, no advantage was observed in a series of 100 patients, whereas in another series of 301 patients, clear advantages were revealed for a drainage period of 24 hours. The risk of seroma is rarely big enough to necessitate leaving a drain except in the case of excessive diffuse blood loss or patients with (iatrogenic coagulopathies (M.P. Simsons et al (2009)).

### Infection

Infection represents a dreaded complication for all types of surgeries and it is no different in inguinal hernia surgeries. Inguinal hernia surgeries complicated by infections have a higher rate of recurrence as the repairs are destroyed along with the tissues. Furthermore, it is important to recognise superficial from deep infections as deep infections are ominous and requires removal of mesh. In the present study, 16% of cases in the drainage group and 20% of patients in the non-drainage group developed postoperative superficial wound infection. None of the patients required removal of mesh. P-value was insignificant. In a meta-analysis conducted by Simchen et al<sup>11</sup> (1990), infection developed in 4% of cases and fourteen factors were analysed for wound infection out of which introduction of subcutaneous suction drains in hernia repair had the strongest effect (relative risks equalled to 4.1;  $p < 0.001$ ). The risk increased with increased duration of wound drainage. M. P. Simsons et al (2009) presence of risk factors for wound infection based on surgery are the use of drains and the use of antibiotic prophylaxis.

### Mean Postoperative Hospital Stay

In the fast-paced life of today, duration of mean hospital stay after surgery may be the determining factor when the rates of other complications are comparable. In our present study, the mean hospital stay in case of drainage group is 9.1 days, whereas in non-drainage group is 6.7 days. In a study conducted by Rahim Mahmudlu et al (2011), postoperative hospital stay is 2.9 days in drainage group and 1.48 days in the non-drainage group, which is statistically significant. In another study conducted by Aachen group (1997), duration of hospital stay was 7 days in case of drainage group and 5 days in case of non-drainage group. In the same study by Aachen group (1997), return to domestic work is 17 days in drainage group and 13 days in case of non-drainage group. In the present study, the mean time the patient took to return to full routine work was not evaluated.

### CONCLUSION

In the present study, 50 patients with inguinal hernia who had undergone Lichtenstein's hernioplasty with subcutaneous suction drain are compared with those who had undergone Lichtenstein's hernioplasty without drain.

After analysing the data, the following are the conclusions from the present study-

- The age of the patients ranged between 18 years and 80 years.

- Maximum number of patients presented between 51 and 60 years of age.
- Male are predominantly affected with inguinal hernias.
- Incidence of indirect hernias was almost twice than that of direct hernias.
- Right-sided hernias are the commonest followed by left-sided hernias.
- Postoperative pain was increased in drainage group than non-drainage group.
- Postoperative haematoma occurrence was slightly higher in non-drainage group.
- Occurrence of seroma following mesh repair was same in both drainage and non-drainage group.
- Postoperative wound infection was slightly more in non-drainage group than drainage group.

The limitations of study are-

1. Small number of patients studied.
2. Short period of study and follow-up.

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