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## Hernioplasty Issue; With Drain Versus Without Drain: A Comparative Study.

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### ABSTRACT

Inguinal hernia is the commonest of all hernias and their repairs are the most common elective procedures performed by surgeons. There is no agreement among surgeons about the need for drains for all hernias types; some use drains accidentally and other mostly use it this study is aiming to assess whether drainage is preferable than no drainage in repair of inguinal hernias by Mesh Hernioplasty and if there is benefit of closed suction drain. Our study included 200 patients underwent Lichtenstein tension free repair of groin hernia, they were randomly allocated into two groups each 100 patients; "the drain" group they have suction drain inserted in just over the mesh prosthesis, and "the no drain" group where no drain was used, we compared the data of operative time, hematoma and seroma formation and postoperative pain. 3 patients developed hematoma in the group without drain while no hematoma developed in the other group. Seroma developed in 14 patients without drain and in 4 patients in the other group, Mesh infection occurred in 2 cases in the group without drain and in 1 case in the other group, occurrence of Seroma, hematoma and mesh infection has non-significant difference between both groups. Postoperative pain and hospital stay time showed statistically significant difference between groups ( $p < 0.001$ ). Drain use doesn't reduce the rate of complications of hernia repair surgery, it seems to increase postoperative pain and hospital stay time, so it should be restricted to complicated cases those with wide intraoperative dissection and those with high ASA score.

**Keywords:** inguinal hernia, with drain, without drain.

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## INTRODUCTION

Inguinal hernia is the commonest of all hernias and their repairs are the most common elective procedures performed by surgeons. The repair of inguinal hernias has favorable outcomes; however, complications can still occur as development of seroma, hematoma, and ecchymosis or wound infections. The complications of herernia repair have been studied previously, but the correlation between these complications and drains use wasn't not strongly documented. Furthermore, there is no agreement among surgeons about the need for drains for all hernias types; some use drains accidentally and other mostly use it (1).

If seroma or hematoma was formed, they can be managed by aspiration, compression and/or surgical drainage.(2) Yet, if dissection is not easy or if other complicating factors are present, some recommend use of suction drainage (3).

In this comparative study, we aim to assess whether drainage is preferable than no drainage in repair of inguinal hernias by Mesh Hernioplasty and if there is benefit of closed suction drain.

### Patients and methods

This comparative clinical trial carried out in zagazig university hospitals over a period of time between June 2017 and May 2019 on 200 patients undergoing Lichtenstein tension free repair of inguinal hernia, patients were randomly allocated into two groups each 100 patients "the drain "group they got a suction drain inserted jus over the mesh prosthesis and "the no drain" group where no drain inserted figure 1, 2, 3 shows mesh hernioplasty , wound closed with drain and without drain respectively.

The study was approved from institutional research board (IRB) and the ethical committee of our university, an informed written consent was taken from all patients.

All operations were performed under spinal anesthesia. In the supine position after skin preparation and patient draping, Skin incision was done 2.5 cm above and parallel to the medial two thirds of the inguinal ligament.

For indirect hernia, hernial sac was dissected, hernial contents were dealt with, and sac neck was twisted, fixed and then ligated.

For direct hernia, the hernial sac was pushed into the abdominal cavity by purse string sutures in transversalis fascia.

Prolene mesh was then placed and fixed to the edges of the deep ring or weakness in the posterior wall of inguinal canal to create a new artificial internal ring, care is taken to allow some laxity to compensate for increased intra-abdominal tension when patient stands.

We used closed system suction drains with a silicon line and it was removed when the daily drainage was less than 30 ml. The patients were mobilized after few hours from operation and the wounds were visualized every day until the patient was discharged.

The daily output of drainage, drain duration, pain and discomfort due to the drain on were recorded in the drain group. On first days after operation, the patients were given non-steroidal anti-inflammatory drugs twice per day. Pain and discomfort due to the drain was categorized as severe, mild or none. The data was collected and recorded on a prospective protocol form.

### Statistical Analysis

Quantitative data were expressed as the mean  $\pm$  SD & median (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Continuous variables were checked for normality by using Shapiro Walk test. Mann Whitney U test was used to compare between two groups of non-normally distributed variables. Percent of categorical variables were compared using Pearson's

Chi-square test or Fisher's exact test when was appropriate. All tests were two sided. P-value< 0.05 was considered statistically significant. All data were collected, tabulated and statistically analyzed using SPSS 20.0 for windows (SPSS Inc., Chicago, IL, USA).

**RESULTS**

Of the total 200 patients, 162 were males and 38 were females. Of the 100 with drain, the mean age was 43.36±13.14, while it was 42.68±13.14 in the group without drain. 76 % of patients with drain were diabetic and 80% were diabetic in without drain group. Of the 100 patients with drain, 30% were direct hernias, 70 % small sized and 79% were reducible. While in the group without drain, 27% were direct hernia, 65 % small sized and 84% were reducible. The basic characteristics of our patients are summarized in table 1.

Regarding treatment outcomes, none of the patients with drain developed hematoma ,while only 3 of the group without drain developed this complication with no statistically significant difference between groups(p=0.246).

Seroma developed in 4 patients with drain and in 14 patients without drain but no statistically significant difference between groups (p=0.013).

Mesh infection occurred in one patient in the group with drain and in 2 in the second group (p=1.000).

Pain was reported in both groups and classified as absent, mild or severe with statistically significant difference between both groups(p=0.001).

Hospital stay ranged from 3-5 days in group with drain while it was one day in the group without drain and there was a statistically significant difference between groups (p<0.001).The treatment outcomes of our studied cases are summarized in table 2.

**Table 1: Comparison between with drain group and without drain group regarding basic characteristics.**

| Basic characteristics    | With drain group (N=100) |     | Without drain group (N=100) |     | p-value |
|--------------------------|--------------------------|-----|-----------------------------|-----|---------|
|                          | No.                      | %   | No.                         | %   |         |
| <u>Sex</u>               |                          |     |                             |     |         |
| Male                     | 83                       | 83% | 79                          | 79% | 1.000‡  |
| Female                   | 17                       | 17% | 21                          | 21% |         |
| <u>Age (years)</u>       |                          |     |                             |     |         |
| Mean±SD                  | 43.36±13.14              |     | 42.68±13.14                 |     | 0.731•  |
| Median (Range)           | 45 (16 – 67)             |     | 45 (17 – 68)                |     |         |
| <u>Diabetes mellitus</u> |                          |     |                             |     |         |
| Absent                   | 76                       | 76% | 80                          | 80% | 1.000‡  |
| Present                  | 24                       | 24% | 20                          | 20% |         |
| <u>Type of hernia</u>    |                          |     |                             |     |         |
| Direct hernia            | 30                       | 30% | 27                          | 27% | 0.638‡  |
| Indirect hernia          | 70                       | 70% | 73                          | 73% |         |
| <u>Size of hernia</u>    |                          |     |                             |     |         |
| Small                    | 70                       | 70% | 65                          | 65% | 0.450‡  |
| Large                    | 30                       | 30% | 35                          | 35% |         |
| <u>Reducibility</u>      |                          |     |                             |     |         |
| Reducible                | 79                       | 79% | 84                          | 84% | 1.000‡  |
| Irreducible              | 21                       | 21% | 16                          | 16% |         |

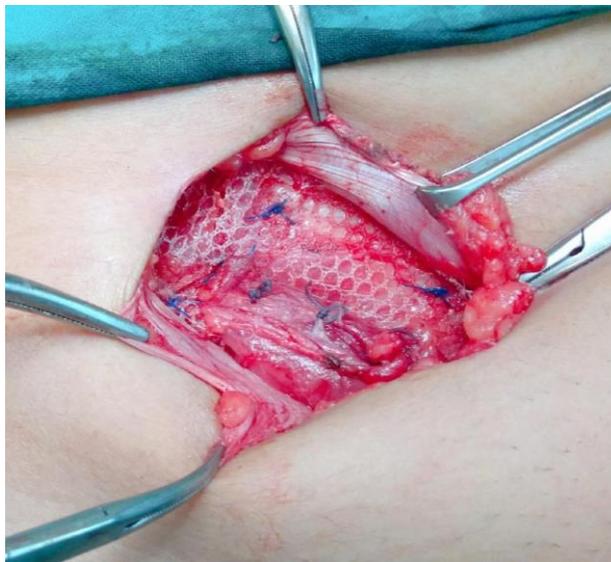
Categorical variables were expressed as number (percentage); Continuous variables were expressed as mean ± SD & median (range); ‡ Chi-square test; • Mann-Whitney U test.

**Table 2: Comparison between with drain group and without drain group regarding outcome of treatment.**

| Outcome of treatment | With drain group (N=100) |      | Without drain group (N=100) |     | p-value |
|----------------------|--------------------------|------|-----------------------------|-----|---------|
|                      | No.                      | %    | No.                         | %   |         |
| <u>Hematoma</u>      |                          |      |                             |     |         |
| Absent               | 100                      | 100% | 97                          | 97% | 0.246‡  |
| Present              | 0                        | 0%   | 3                           | 3%  |         |
| <u>Seroma</u>        |                          |      |                             |     |         |
| Absent               | 96                       | 96%  | 86                          | 86% | 0.013‡  |
| Present              | 4                        | 4%   | 14                          | 14% |         |
| <u>Infected mesh</u> |                          |      |                             |     |         |
| Absent               | 99                       | 99%  | 98                          | 98% | 1.000‡  |
| Present              | 1                        | 1%   | 2                           | 2%  |         |
| <u>Pain</u>          |                          |      |                             |     |         |
| Absent               | 16                       | 16%  | 4                           | 4%  | 0.001‡  |
| Mild pain            | 79                       | 79%  | 96                          | 96% |         |
| Moderate-Severe pain | 5                        | 5%   | 0                           | 0%  |         |
| <u>LOS (days)</u>    |                          |      |                             |     |         |
| Mean±SD              | 3.61±0.92                |      | 1±0                         |     | <0.001• |
| Median (Range)       | 3 (3 – 5)                |      | 1 (1 – 1)                   |     |         |

Categorical variables were expressed as number (percentage); Continuous variables were expressed as mean ± SD & median (range); ‡ Chi-square test; • Mann-Whitney U test.

**Figure 1: Mesh hernioplasty**



**Figure 2 Inguinal wound closed with drain**



**Figure 3 Inguinal wound closed without drain**



## DISCUSSION

Drains use in elective surgery is a never ending issue. The rising rate of hernia repair by minimally-invasive methods has increased new concern in discomfort reduction after open hernia repair. This discomfort after operation is partially due to drain insertion in the area of wound. Another somewhat insignificant issue is the cost regard with the need for drains. Also, drains are usually undesirable when the surgery is performed as an outpatient procedure. On the other hand, all surgeons recall their patients with seromas or hematomas after hernia repair. These complications may cause significant embarrassment to the patient and also to the surgeon (5).

Our study included 200 patients, 57% were direct hernias, and the remaining was indirect type. Indirect hernia represented 76% in Palanivelu, 2000 study (6) and 63% in Robb study (7). The results are consistent with the previous studies results.

Neuralgia after Lichtenstein's hernioplasty is the most worrisome complication in the inguinal region. Some cases are presented by debilitating postoperative pain requiring re-exploration and nerve division. In the current study, only the immediate postoperative pain was assessed. 84% of drainage group patients suffered from pain, whereas 96% of patients complained of pain in the non-drainage group with statistically significant difference between both groups. Sobhiyeh Mohammed et al (2011) study (8) revealed no significant difference in pain after Lichtenstein's mesh hernioplasty with and without drains (95% vs. 90%). The significant high number of patients complaining from pain in our study maybe attributed to the pain, that accompany

any surgery (with no specific scoring system to quantify pain and only patient complaint was put into consideration) and surely there is individual variation in pain threshold.

Bleeding from artery or vein may occur in all anatomic levels during inguinal repair and this results in formation of hematoma. In our study, 0% and 3% of patients developed haematoma in drainage and non-drainage group, respectively with no significant statistically difference between groups ( $p=0.246$ ). In Rahim Mahmudlu et al study (2011) (9); 9.7% of all patients showed haematoma. In drainage group in comparison to 3.4% in the group without drain with no significant difference noticed in the compared groups (total 60 patients 31 with drain and 29 without drain). So, It is recommended that wound drains to be used if indicated (as coagulopathies or much blood loss).

Seroma correspond to exudates (e.g., water, solutes, plasma or proteins with fibrin and PNLs). These seromas are the results of scalpel trauma, scissors, cautery or presence of foreign bodies. In our present study, 4% of patients in the drainage group developed seroma and 14% of patients in the group without drain developed this complication. The p-value was insignificant ( $p=0.013$ ). This result was consistent with Rahim Mahmudlu et al (2011)(9) study results that showed seroma in 3.2% of patients in drainage group vs 0% in the non-drainage group with no significant statistical difference observed. Studies regarding post-operative drainage for seromas prevention are conflicting. In two RCTs of patients after open intervention, no benefits were seen in 100 patients series, where in another 301 patients, obvious advantages were seen with a drainage for 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 (10).

Infection is complication for any type of operation and it is not specific or different in inguinal hernia repairs. Inguinal hernia operations that are complicated with infections show a higher rate of recurrence because the repairs can be destroyed beside the tissues. Additionally, it is very important to differentiate superficial and deep infections as deep ones are more serious and require mesh removal (11). In the present study 1% of cases in the drainage group and 2% of patients in the non-drainage group developed infection but no one of these patients required mesh removal. The P-value was statistically insignificant. In Simchen et al (1990) meta-analysis (12), infection occurred in 4% of cases and fourteen factors were analyzed 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 increasing the drainage duration, presence of risk factors for wound infection based on surgery are the use of drains and the use of antibiotic prophylaxis.

## CONCLUSION

The use of drain after hernia repair does not add much to the patients. Our study reported no significant difference between groups with and without drains regarding hematoma, seroma or infection. So, it is better to avoid drain except in selected cases as longer duration of operation, dissection and high ASA.

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