



A COMPARATIVE STUDY BETWEEN THE PHSE AND LICHTENSTEIN TENSION FREE MESH HERNIOPLASTY FOR INGUINAL HERNIA

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ABSTRACT

Background: Although inguinal hernia repair is the most frequently performed surgical procedure in the world, the best repair method has not gained acceptance yet. The ideal repair must be safe, simple, and easy to perform and require minimal dissection which provides enough exploration, maintain patient's comfort in the early stage, and also be cost-effective, reducing operation costs, labor loss, hospital stay, and recurrence. **Aim:** to compare Lichtenstein and prolene hernia system for inguinal hernia. **Methods:** This was a prospective study conducted over 60 adult patients of both genders admitted Dr. RPGMC Tanda at Kangra from September 2016 to September 2017. Patients clinically diagnosed with inguinal hernias both direct and indirect on examination were enrolled in the trial after their informed consent. The patients were divided into two treatment groups: Group A subjected to prolene hernia system extended (PHSE), and group B subjected to Lichtenstein tension free mesh hernioplasty. **Results:** We observed that 63% patients in Lichtenstein group and 53% patients in PHSE group had minimal pain. Post-operative pain was comparable between the groups ($P=0.432$). 77% of the patients in PHSE group and 23% patients in Lichtenstein group had no complications. Complications were significantly higher in Lichtenstein group in comparison to PHSE group ($P=0.001$). There was no recurrence in any of the patients in both groups. Time taken to return to normal activity was significantly higher in Lichtenstein group in comparison to PHSE group (23.1 ± 2.76 days vs. 14.2 ± 2.13 days; $P=0.0001$). **Conclusion:** PHSE provides all the advantages of a tension-free repair, including less patient discomfort, less post-operative pain, lesser duration of hospital stay, rapid return to normal activity and minimal post-operative complications

KEYWORDS :PHSE, Prolene Hernia System Extended; Lichtenstein tension free mesh repair, Pain

INTRODUCTION

Abdominal wall hernias are common, with a prevalence of 1.7% for all ages and 4% for those aged over 45 years. Inguinal hernias account for 75% of abdominal wall hernias, with a lifetime risk of 27% in men and 3% in women.¹ Repair of inguinal hernia is one of the most common operations in general surgery, with rates ranging from 10 per 100 000 of the population in the United Kingdom to 28 per 100 000 in the United States.²

Inguinal hernias present with a lump in the groin that goes away with minimal pressure or when the patient is lying down. Most cause mild to moderate discomfort that increases with activity. A third of patients scheduled for surgery have no pain, and severe pain is uncommon (1.5% at rest and 10.2% on movement).³

Inguinal hernias are at risk of irreducibility or incarceration, which may result in strangulation and obstruction; however, unlike with femoral hernias, strangulation is rare. Old age, prolonged duration of hernia and irreducibility are risk factors for acute complications.

There is currently no medical recommendation about how to manage an inguinal hernia condition, due to the fact that until recently, elective surgery used to be recommended for all inguinal hernias. The reason for this recommendation is the

feared risk of complications such as incarceration or strangulation.⁴

Lichtenstein hernioplasty is tension-free repair uses an open anterior approach sutures a mesh patch over the hernia in front of the abdominal muscle wall. The Lichtenstein hernioplasty, "bypasses the problem of working with degenerated tissue by placing the edges of the patch on surrounding healthy tissue, providing a stronger reinforcement for the abdominal wall."

The tension free method utilizing the prolene hernia system uses a "three-in-one" device consisting of an on lay patch that goes on top of the abdominal wall, a connector piece that plugs the defect and an underlay patch that deploys in the preperitoneal space and provides support behind the abdominal wall.

The present study was aimed to compare Lichtenstein and prolene hernia system helps to know the safest procedure available, associated with the least post-operative discomfort, most rapid return to normal activity and with the lowest rate of recurrence at Dr. RPGMC Kangra at Tanda.

METHODS

This was a controlled study conducted over 60 adult patients of both genders admitted Dr. RPGMC Tanda at Kangra from

September 2016 to September 2017. Patients clinically diagnosed with inguinal hernias both direct and indirect on examination were enrolled in the trial after their informed consent. Patients with complicated inguinal hernias (incarcerated, Strangulated), femoral hernia, children, and those unable to provide consent were excluded from the study.

The patients were divided into two treatment groups: Group A subjected to prolene hernia system extended (PHSE), and group B subjected to Lichtenstein tension free mesh hernioplasty.

Patients were informed about surgical procedure and type of anesthesia and informed written consent was taken. Operative times (skin incision to skin closure) was recorded for each repair. Perioperative complications including iatrogenic vessel and nerve injury, seroma, hematoma, urinary retention, or wound infection, stiffness of the abdominal wall as well as anesthesia related complication were recorded.

STATISTICAL ANALYSIS

Data were presented as frequency, percentage, mean, and standard deviation wherever applicable. Categorical variables between the groups were analyzed using Chi square test or Fischer exact test. Quantitative variables between 2 groups were compared using Student t-test. P value <0.05 was considered significant. Statistical analyses were performed using SPSS v21.0 (IBM, USA).

RESULTS

General characteristics

Table 1 compares general characteristics of the study subjects. The patients in both groups were comparable in terms of age, smoking history, alcohol abuse, co-morbidities, and previous history of surgery ($P>0.05$). Platelets count was significantly higher in PHSE group ($P=0.032$). Duration of surgery was significantly higher in Lichtenstein group in comparison to PHSE group ($P<0.0001$). Duration of hospital stay was significantly higher in Lichtenstein group in comparison to PHSE group ($P=0.0001$).

Type of hernia

Direct hernia was the most common in Lichtenstein ($n=21$) and PHSE ($n=15$) groups. There was no significant difference between type of hernia with type of surgery ($P=0.267$) (Figure 1).

Post-operative pain

We measured post-operative pain at the time of discharge on a 10-point VAS scale. Scores between 7-10, 4-6, and 1-3 were categorized as severe, moderate, and mild pain respectively. Score 0 was categorized as no pain. We observed that 63% patients in Lichtenstein group and 53% patients in PHSE group had minimal pain. Post-operative pain was comparable between the groups ($P=0.432$) (Figure 2).

Complications

77% of the patients in PHSE group and 23% patients in Lichtenstein group had no complications. Complications were significantly higher in Lichtenstein group in comparison to PHSE group ($P=0.001$) (Table 2).

Recurrence

There was no recurrence in any of the patients in both groups.

Return to normal activity

Our study found that time taken to return to normal activity was significantly higher in Lichtenstein group in comparison to PHSE group (23.1 ± 2.76 days vs. 14.2 ± 2.13 days; $P=0.0001$).

DISCUSSION

This study compared PHSE and Lichtenstein tension free

mesh hernioplasty for inguinal hernia.

Duration of surgery was significantly higher in the Lichtenstein repair in comparison to PHSE group. Dalenbäck and Zhao reported a remarkably shorter duration of operation for mesh plug repair compared with that for Lichtenstein repair.⁵ They stated that the surgeons both learned and performed mesh plug repair more easily. Mesh plug repair seems to be shorter and more advantageous compared with Lichtenstein repair regarding the duration of operation. However, the duration of operation was found to vary between 20 and 50 minutes.⁶

The duration of hospitalization was reported to be similar in various studies comparing mesh plug repair and Lichtenstein repair.^{7,8} When the duration of hospitalization was analyzed in this study, the Prolene hernia mesh technique resulted in a shorter hospitalization, which is more advantageous. In this study, the duration of hospitalization in the PHSE group was 23.93 hours and is compatible with the literature.

There are a number of complications known to arise with some regularity. In present study, most common complication was inguinodynia. We also observed that complications were significantly higher in Lichtenstein repair group in comparison to PHSE group. 30% patients in Lichtenstein group and 7% patients in PHSE group developed inguinodynia. Since, in Lichtenstein group, more sutures are required to fix the mesh so there are more chances of nerve entrapment, resulting in inguinodynia.

63% patients in Lichtenstein group and 53% patients in PHSE group had minimal pain. Post-operative pain was comparable between the groups ($P=0.432$). The incidence of chronic groin pain was lesser in the PHSE group when compared to the LMR group in the study by Shankar et al.⁹ Similarly, majority of the studies showed lesser chronic groin pain in PHSE group.¹⁰

In Lichtenstein group, seroma, urinary retention, and scrotal swelling was observed in 6, 3, and 5 patients respectively while in PHSE group, seroma, urinary retention, and scrotal swelling was observed in 1, 1, and 3 patients respectively. In the study by Destek and Gul, 22.9% of patients who had undergone Lichtenstein mesh repair developed seroma.¹¹ In a study by Fasih et al., 2% of patients who had undergone mesh plug hernioplasty developed seroma.¹² Retention of urine in case of an inguinal hernia repair is usually transient and is mostly due to post-operative neuralgia commonly seen in elderly.

The recurrence rate has always been considered an important parameter to assess the effectiveness of any form of hernia repair and is the ultimate test. There are multiple studies, which have determined the recurrence rate for different techniques. In our study, recurrence was not observed in any of the patients.

CONCLUSION

In conclusion, the PHSE provides all the advantages of a tension-free repair, including less patient discomfort, less post-operative pain, lesser duration of hospital stay, rapid return to normal activity and minimal post-operative complications when compared to Lichtenstein tension free mesh repair. These benefits have been observed in the limited time period of case studies so far. In our study, recurrence was not observed in any of the patients however, theoretically PHSE has less chances of recurrence as the underlay component secures the myopectineal orifice and the on lay component secures the posterior wall of the inguinal canal so protects both the femoral and inguinal regions from recurrence. In addition, it is easy to use, requires fewer sutures

for fixation and is more comfortable for the patient in the postoperative period, in our experience. It provides a stable anterior repair with the added benefits of a posterior repair and plug repair.

Table 1: General characteristics

	Lichtenstein (n=30)	PHSE (n=30)	P Value
Age (years)	57.8±13.4	54.9±13.7	0.411
Sex (Male), n	30	30	-
Smoking, n	9	13	0.284
Alcohol abuse, n	19	16	0.432
Co-morbidities, n	9	6	0.276
Previous history of surgery	5	2	0.212
Hb	11.75±1.08	11.49±1.19	0.373
Platelets	153866.67±50651.43	192500.00±75036.89	0.032
INR	1.08±0.25	1.02±0.21	0.304
Duration of Surgery (Mins)	61.03±5.24	55.10±6.42	<0.0001
Hospital Stay (Hrs.)	37.83±5.76	23.93±5.62	0.0001

Table 2: Complications

	Lichtenstein (n=30)	PHSE (n=30)	P Value
Inguinodynia	9	2	0.001
Seroma Formation	6	1	
Urinary retention	3	1	
Scrotal Swelling	5	3	
Nil	7	23	

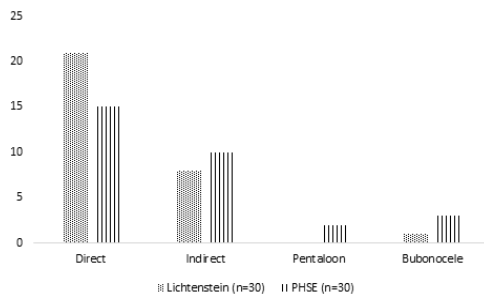


Figure 1: Type of hernia

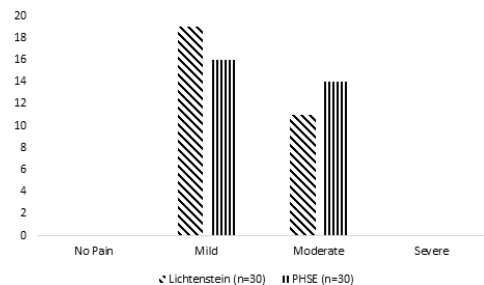


Figure 2: Comparison of post-operative pain

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