



A PROSPECTIVE FOLLOW UP STUDY OF SURGICAL OUTCOMES OF LICHTENSTEIN INGUINAL HERNIA REPAIR IN A TERTIARY CARE HEALTH CENTRE IN PUDUCHERRY

General Surgery

Dr. Firdaus Fatima*

3rd year Postgraduate, Department of General Surgery, Aarupadai Veedu Medical College, Vinayaka Mission Research Foundation Deemed to be University, Pondicherry.
*Corresponding Author

Dr. S Madhivanan

Professor, Department of General Surgery, Aarupadai Veedu Medical College, Vinayaka Mission Research Foundation Deemed to be University, Pondicherry

Dr. Prabhu

Associate Professor, Department of General Surgery, Aarupadai Veedu Medical College, Vinayaka Mission Research Foundation Deemed to be University, Pondicherry

Dr. Amruth

3rd year Postgraduate, Department of General Surgery, Aarupadai Veedu Medical College, Vinayaka Mission Research Foundation Deemed to be University, Pondicherry

ABSTRACT

Introduction: Lichtenstein's tension free hernioplasty was superior in terms of minimal postoperative complications and low recurrence rate in earlier studies as compared to other surgical methods. The present study aimed to assess the surgical outcomes among the patients undergoing the Lichtenstein inguinal Hernioplasty. **Material & Method:** This prospective follow-up study was conducted among the patients with inguinal hernia visiting Department of Surgery, Aarupadai Veedu Medical College (AVMCH) who were more than 18 yrs of age. Following the surgery, the patients were followed up for pain, wound healing, foreign body sensation, testicular complications, other post operative complications, return to normal activities and recurrence. All the data were analysed and represented using tables and figures. **Result:** The present study included 100 patients fulfilling inclusion criteria with mean age of 46.410±13.93yrs of age. Among the participants, 95% were male and 5% were female patients with male preponderance. Mean Visual Analogue Scale (VAS) score was found to be 6.24 at postoperative 1st hr, 7.32 at 3rd hr, 5.62 at 6th hr and 2.96 at 1 week of post-operative period. Wound healing was seen by 1st week of post operative (OP) period in 96% of the patients, the foreign body sensation was present for little longer time for upto 1 month duration, wound dehiscence was seen in 4 patients in 1st week, which was healed and no dehiscence was documented after 2nd week of POD. Mesh displacement, mesh shrinkage and recurrence were absent among the patients. Testicular complications and sepsis were not noted in the present study. The period of ambulation in patients was 2 days in 76%, 1 day in 20% and 3 days of postoperative period in 4% cases. **Conclusion:** The present study documented good outcome among the patients undergoing the Lichtenstein inguinal Hernioplasty. Study documented wound complications and there was no recurrence documented in the study.

KEYWORDS

Lichtenstein, Hernioplasty, Wound healing, Dehiscence, Foreign body, Visual Analogue Scale, Mesh, Postoperative

INTRODUCTION

The history of open hernia repair has gone through several stages of development tracing as far back as in ancient Egyptian and Greek civilizations¹. Hernia surgery saw its breakthrough in the 19th century with the initial description by Marcy and Bassini. Hernia is derived from the Latin word for rupture². It is defined as an abnormal protrusion of a part or whole of a viscus through the wall of its containing cavity. Approximately 75% of abdominal wall hernias occur in groin. Of the inguinal hernia repairs, 90% are performed in men, 10% in women. A lifetime risk of inguinal hernia is 27% in men and 3% in women.³ The incidence of inguinal hernia in men has a bimodal distribution, with peaks before the first year of age and after 40 years of age. Approximately 70% of femoral hernia repairs are performed in women; however the most common subtype of groin hernia in men and women remain to be the indirect inguinal hernia. Inguinal hernias are five times more common than femoral hernias.¹

Globally, the inguinal hernia repair has become one of the most common procedures in improving the quality of life and preventing disability.⁴ There are various open techniques of inguinal hernia repair such as Shouldice and Mc Vay, Bassini, Lichtenstein⁵ etc. which are known till date and performed under General, regional or local anaesthesia as well as paravertebral block. Studies have shown that among the various open hernia repair techniques, Lichtenstein's tension free hernioplasty was superior in terms of minimal postoperative complications and low recurrence rate as compared to other surgical methods.⁶ Nonetheless few surgical complications such as chronic pain, foreign body sensation, stiff lower abdominal wall, infection, sinus formation, migration of mesh, wound hematoma, seroma and orchitis etc. have been variably reported in patients. Studies in the past have hypothesised that the inflammatory reaction and scar formation caused by the mesh is responsible for the high incidence of post-operative pain.⁷ Despite the frequency of the procedure, surgeons in the past have not been able to establish ideal results in terms of rate of complications such as postoperative pain, nerve injury, infection and recurrence.^{8,9} The present study aims to provide data on such postoperative complications, rate of wound healing, postoperative pain and recurrences following Lichtenstein hernia repair.

II. MATERIAL AND METHODS

This prospective follow up study was conducted in a Tertiary Care Hospital in Puducherry. Patients with inguinal hernia aged 18 years and above who gave informed consent were included in the study. Pregnancy, psychiatric illness, recurrent hernia, associated femoral/umbilical hernia, hypersensitivity to local anesthesia were exclusion criteria. 100 patients were selected using convenience sampling. After taking detailed history and clinical examination of the patients all routine blood investigations, viral markers, chest x ray, ECG, USG abdomen and PAC were obtained. All patients were treated with Lichtenstein inguinal hernioplasty. Study for the type of hernia, intraoperative/postoperative complications, pain, duration of stay in hospital and ambulation time were recorded. Patients were followed up postoperatively at the end of 1 week, 2 weeks, 1 month and 3 months and looked for pain using Visual Analogue Scale (VAS) score, wound healing, wound dehiscence, wound discharge, infection, seroma formation, foreign body sensation, mesh related complications, testicular complications, urine retention, return to normal activities and recurrence. Patients complaining of persistent pain at the operative site during the 3rd month follow up were considered as having chronic pain. Ultrasonography was done on 2nd, 3rd and 4th follow up visits for determining local tissue reaction, subclinical recurrence, testicular atrophy and mesh shrinkage/mesh displacement.

III. Statistical Analysis

All data were entered in excel sheet and analysed using SPSS v21 operating on windows 10. The data were summarised as frequency, percentage, mean and standard deviation. The summarised data were represented using tables, figures, bar diagram and pie charts. The mean difference between the continuous data was analysed using t-test, for follow-up data paired t-test and for categorical data Chi-square test was used to determine the significance between the parameters observed in this study. A p value of <0.05 was considered accepted as significant.

IV. RESULTS

Present study included 100 patients fulfilling inclusion criteria with mean age of 46.410±13.93yrs of age. Among the participants, 95%

were male and 5% were female patients male preponderance. Mean VAS score was found to be 6.24 at post OP 1st hr, 7.32 at 3rd hr, 5.62 at 6th hr and 2.96 at 1 week of post-operative period. Wound healing was seen by 1st week of post operative period in 96% of the patients, the foreign body sensation was present for little longer time, for upto 1 month duration, wound dehiscence was seen in 4 patients in 1st week, which healed and no dehiscence was documented after 2nd week of postoperative period. Mesh displacement, mesh shrinkage and recurrence was absent among the patients. Testicular complications and sepsis were not noted in the present study. The period of ambulation in patients was 2 days in 76%, 1 day in 20% and 3 days of postoperative period in 4% cases.

Table 1: Mean age of the patients

	N	Minimum	Maximum	Mean	SD
Age in yrs	100	18.0	80.0	46.410	13.93

The present study included 100 patients fulfilling inclusion criteria with mean age of 46.410±13.93 yrs of age.

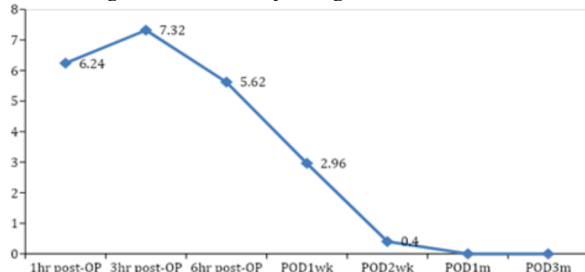


Figure : Showing the mean change in pain score (VAS) at different interval of time

On pain assessment using VAS score, the mean score was found to be 6.24 at post OP 1st hr, 7.32 at 3rd hr, 5.62 at 6th hr and 2.96 at 1 week of post-operative period. After that there was no pain documented by 2nd week of the post operative period. [OP = operation , POD = post operative day]

Table 2: Showing the presence of wound healing at different interval of time

	Absent		Present	
	Frequency	Percent	Frequency	Percent
POD 1wk	4	4.0	96	96.0
POD 2wk	-	-	100	100.0
POD 1m	-	-	100	100.0
POD 3m	-	-	100	100.0

Wound healing was seen by 1st week of post operative period in 96% of the patients.

Table 3 : Showing the presence of foreign body sensation at different interval of time

	Absent		Present	
	Frequency	Percent	Frequency	Percent
POD 1wk	92	92.0	8	8.0
POD 2wk	96	96.0	4	4.0
POD 1m	95	95.0	5	5.0
POD 3m	100	100.0	-	-

The foreign body sensation was present for little longer time, for upto 1 month duration.

Table 4 : Showing the period of ambulation with type of anaesthesia

Ambulation period	Days	Frequency	Percent
Local anaesthesia	1	4	100
General anaesthesia	2	4	100
Spinal anaesthesia	1	16	17.4
	2	72	78.2
	3	4	4.4

The local anaesthesia showed the early ambulation and shorter hospital stay among the patients compared to the general anaesthesia and the spinal anaesthesia.

V. DISCUSSION AND CONCLUSION

The present study aimed to assess the surgical outcomes among the patients undergoing the Lichtenstein inguinal Hernioplasty. The

present study included 100 patients fulfilling inclusion criteria with mean age of 46.410±13.93yrs of age. Among the participants, 95% were male and 5% were female patients with male preponderance. Among the patients, 34% were heavy workers, 55% were semisedentary and 11% were sedentary. Among the patients, the direct hernia was seen in 34% and indirect hernia in 66% of the patients. The side of involvement, 26% were presented with left side hernia and 74% with right sided hernia.

In study by Vasu S et al., the maximum number of patients belonged to age group of 40- 60 years, which had 24 patients (48%). Youngest patient being 26 years old and oldest patient being 77 years with the mean age of 49.3±13.7 years. Male preponderance was observed in the study (n=48; 96%). 36 (72%) patients presented with right sided inguinal hernia, 10 (20%) patients had left sided inguinal hernia and 4 patients i.e. 8% had bilateral inguinal hernia. 39 (78%) patients had indirect hernia and 11 (22%) patients had direct hernia. The mean operative time was 52.32±13.14 mins.¹⁰

In a study by Nateson AK et al., among the patients 84 were males (93%) and 6 were females (6.6%). Age of the subjects was 21 to 75 years. Maximum numbers of patients were in the age group of 41-50, which had 29 (32.2%) cases. Right sided hernia was observed in 56 (62.2%) patients, left sided hernia was observed in 24 (26.6) patients and 10 patients had bilateral hernia. Among 90 patients direct hernia was observed in 75 (83.3%) patients and indirect hernia was observed in 15 (16.6%) patients.¹¹

On pain assessment in the present study using VAS score, the mean score was found to be 6.24 at post OP 1st hr, 7.32 at 3rd hr, 5.62 at 6th hr and 2.96 at 1 week of post-operative period. After that there was no pain documented in patients by 2nd week of post operative period. Wound healing was seen by 1st week of post operative period in 96% of the patients. The foreign body sensation was present for little longer time, for upto 1 month duration. Wound dehiscence was seen in 4 patients in 1st week, which healed and no dehiscence was documented after 2nd week of POD. Wound discharge was seen in 18% on 1st week and by second week it reduced to 4%. The seroma formation was seen in 4% of the patients at 1st week of POD. The total hospital stay was 63% with less than 3 days of period. Mesh displacement, mesh shrinkage and recurrence was absent among the patients. Testicular complications and sepsis were not noted in the present study. The period of ambulation in patients was seen as 2 days in 76%, 1 day in 20% and 3 days in 4% cases. The patients operated under local anaesthesia showed the early ambulation and shorter hospital stay duration in comparison to the general and spinal anaesthesia among the patients.

In concordance of the present study, Nienhuijs S et al., documented for pain, sensory impairments, or recurrences. There were no appreciable differences between the healing approaches. Hernia recurrence rate as a whole was 6.3%. A total of 63 patients (23%) reported having chronic pain, of which 14% were classified as having moderate to severe pain. 26 patients (10%) reported experiencing pain at least once a week, while 36 patients (13%) reported that it limited their daily activities. At 3 and 15 months after the initial reporting of pain, 106 patients (or 39% of the total) report no discomfort at all. 101 individuals (37%) had a reduction in early discomfort. 41 individuals (15%) experienced ongoing discomfort at each of the three measurement points. After an initial period of no discomfort, 22 patients (8%) of the total experienced pain at the 8-year follow-up. The long-term results revealed no clinically significant variations in chronic pain and its effects. Chronic discomfort, though it lessens over time and might occasionally start years after the inguinal surgery, is nonetheless a significant consequence.¹²

In the study carried out by Vasu S et al., the average post-operative hospital stay was 4.06±1.43 days and the average post-operative ambulation time was 1.52±0.64 days. Findings of the study concluded that Lichtenstein's hernioplasty is associated with less chronic pain with only few postoperative complications. Also, zero recurrence rates even after 1 year of follow up. Hence concluding that Lichtenstein's hernioplasty was safe and reliable procedure for inguinal hernia repair. Mean intra-operative time (minutes) was 53.43±15.12, post-operative hospital stay (days) was 5.06±1.91 and post-operative ambulation time was (1.72±0.71) in study by Nateson AK et al., Immediate post-op complications like seroma/hematoma was in 10 (11.1%), wound infection was in 5 (5.5%) and orchitis was in 2 (2.2%) cases observed

repectively. A postoperative complication like stiffness in lower abdomen was observed in 21 (23.3%) patients. The study results indicated that Lichtenstein's Hernioplasty has very few complications and zero recurrence rate after 1 year follow up. Hence concluding that Lichtenstein hernioplasty is a preferred technique for inguinal hernia repair.

Previous studies on the topic were done on assessing the percentage of wound complications, postoperative pain, recovery time and recurrence rate following Lichtenstein hernia repair. However these outcomes have not been compared when done under Local anaesthesia and Spinal anaesthesia. My study will provide data to compare the wound healing rate, wound complications, postoperative pain, recovery rate and ambulation time when done under local anaesthesia and spinal anaesthesia.

Expected outcome of Lichtenstein inguinal hernia repair is to have fewer complications both intraoperatively and postoperatively, better wound healing rate and low recurrence. Present study documented a good outcome among the patients undergoing the Lichtenstein technique for inguinal hernia repair with minimal post-operative complications. Hence Lichtenstein inguinal hernia repair is a safe and reliable surgical procedure and should be considered as gold standard surgical technique for inguinal hernia repair.

The present study documented good outcome among the patients undergoing the Lichtenstein inguinal Hernioplasty. Study documented few wound complications and no recurrence was recorded in the study. There was no mesh related complications among the patients. Study also recorded less number of hospital stay and early ambulation among the patients with over all good satisfactory response and acceptance by the patients.

VI. REFERENCES

1. Johnson J, Roth JS, Hazey J, Pofahl W. The history of open inguinal hernia repair. *Curr Surg.* 2004;61(1):49–52.
2. Malangoni MA, Rosen MJ. Hernia and Abdominal wall. In: Townsend CM, Beauchamp RD, editors. *Sabiston Textbook of surgery.* 19th ed. Philadelphia, PA: Elsevier Saunders; 2019. p. 1114–40.
3. Abramson JH, Gofin J, Hopp C, Makler A, Epstein LM. The epidemiology of inguinal hernia. A survey in western Jerusalem. *J Epidemiol Community Heal.* 1978;32(1):59–67.
4. Wagner JP, Brunicaudi FC, Amid PK, Chen avid C. Inguinal hernias. In: Brunicaudi F, Andersen D, editors. *Schwartz's Principles of Surgery.* 10th ed. New York: Mc Graw Hill Education; 2014. p. 1495– 520.
5. Bhat S. Inguinal Hernia. In: *SRB's Manual of Surgery.* 6th ed. New Delhi: Jaypee Brothers Medical Publishers; 2019. p. 743–59.
6. Cheong KX, Lo HY, Neo JXA, Appasamy V, Chiu MT. Inguinal hernia repair: are the results from a general hospital comparable to those from dedicated hernia centres? *Singapore Med J.* 2014;55(4):191–4.
7. Klinge U, Klosterhalfen B, Müller M, Schumpelick V. Foreign body reaction to meshes used for the repair of abdominal wall hernias. *Eur J Surg.* 1999;165(7):665–73.
8. Vrijland WW, van den Tol MP, Luijendijk RW, Hop WCJ, Busschbach JJ V, de Lange DCD, et al. Randomized clinical trial of non-mesh versus mesh repair of primary inguinal hernia. *Br J Surg.* 2002 Nov 5;89(3):293–7.
9. Bay-Nielsen M, Nordin P, Nilsson E, Kehlet H. Operative findings in recurrent hernia after a Lichtenstein procedure. *Am J Surg.* 2001;182(2):134–6.
10. Vasu S, Sagar K. A clinical study of post operative complications of Lichtenstein's hernioplasty for inguinal hernia. *Int Surg J.* 2018;6(1):13–9.
11. Nateson AK, Basavanayak SN. Study of the Lichtenstein's hernioplasty and its post-operative complications for different types of inguinal hernia. *Int Surg J.* 2019;6(7):2514–8.
12. Nienhuijs SW, Rosman C. Long-term outcome after randomizing prolene hernia system, mesh plug repair and Lichtenstein for inguinal hernia repair. *Hernia.* 2015;19(1):77–81.