

Postoperative Complications in Lichtenstein Repair Under Spinal Anesthesia

Muhammad Fahad

ABSTRACT

Objective: To describe postoperative complications in Lichtenstein repair under spinal anesthesia.

Study Design: Descriptive, prospective, cohort study

Place and Duration of Study: This study was conducted at the Abbasi Shaheed Hospital, Karachi for six months duration from 07.02.2023 till 06.08.2023.

Methods: It is a descriptive, prospective¹, cohort study with both qualitative and quantitative aspects. My research is focus on postoperative complications occurs after Lichtenstein repair. Sample size was derived from formula² and through internet based calculator.net which is 194. The no of participants selected through consecutive method of sampling and follow ups are done postoperatively in wards and on out-patient department bases. The postoperative complications were taken as variables and analysed through SPSS. The patients are between 21 and 85 years old. We categorized the individuals into two distinct groups F1 and F2. In the F1 group, we used the European hernia society classification (EHS), and in the F2 group, we used ultrasound and the EHS classification to determine accurate defect size. Lichtenstein repair is the procedure of choice. Postoperative complications were evaluated.

Results: According to our results, we found that out of the 97/194 patients in the F1 group, 51 have lateral inguinal hernia and 41 have medial inguinal hernia. In the F2 group, 43 patients have lateral inguinal hernia, and 49 patients have medial inguinal hernia. Postoperative complications. In our study, many patients who developed complications had Lichtenstein repair done by postgraduate surgeons under supervision and surgical registrars. Experienced surgeons like Professor and Associate Professor have performed Lichtenstein repairs on patients with negligible or fewer complications.

Conclusion: Accurate estimation of defect size, adequate spinal anesthesia with experienced anesthetists, proper fixation and overlapping of mesh, proper suture material, and instruments with proper lightning and sterilization techniques—surgical experience noted >300 lichtenstein repairs can reduce postoperative complications in Lichtenstein repair.

Key Words: Postoperative Complications, Lichtenstein Repair, Spinal Anesthesia

Citation of article: Fahad M. Postoperative Complications in Lichtenstein Repair Under Spinal Anesthesia. Med Forum 2024;35(5):18-22. doi:10.60110/medforum.350504.

INTRODUCTION

Across the world 20 million patients did Lichtenstein repair yearly. It is one of the best and frequent surgical procedure offered in the world. The rate of occurrence of inguinal hernia is 27-43% for male and 3-6% for female^{3,10}. Lichtenstein repair is a type of open inguinal hernia repair with tension free mesh repair technique.

The tension free concept got its description with Irving Lichtenstein (1920-2000) belong to Los Angeles in the

second edition of his famous hernia article. He formulated a tension free repair by implanting prosthetic material to fix the gap between the muscular and ligament tissues.

His repair evenly used R/Marlex as mesh in a classic anterior inguinal approach. He made the intervention to an state of art procedure. The efforts of Lichtenstein ends with flying colours that it is still one of the best evidence based mesh repair technique in the world. Prolene Hernia System is an adaptation of the Lichtenstein technique in which implantation of a double sided prolene mesh is done before and after the muscle by an open incision. In 1987 Lichtenstein bring out his data registry configuration. It had his own observations with over 6000 demonstrations and he also incorporated his classification system.

Despite all advances, postoperative complications in Lichtenstein repair is still the matter of debate.^{4,5} A clinical study showed the rate of developing intraoperative complications is 6% and immediate postoperative complications was seen in 12% Patients⁶. Postoperative surgical complications are classified

¹. Department of General Surgery, University of Karachi.

Correspondence: Dr. Muhammad Fahad, Postgraduate MS, Department of General Surgery, University of Karachi.

Contact No: 03452146010

Email: fahad_ansar@hotmail.com

Received: December, 2023

Accepted: January, 2024

Printed: May, 2024

usually according to Clavien Dindo Classification (CDC)^{7,8}. This classification is constituted to categorize the severity of a surgical outcome. It is based on the line of management needed to correct the complications⁹. The scale divided into several grades

Grade 1: Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic and radiological interventions.

Grade 2: Requiring pharmacological treatment with drugs other than such allowed for Grade I complications. Blood transfusions and total parenteral nutrition are also included.

Grade 3: Requiring surgical, endoscopic or radiological intervention.

Grade 3 a: Intervention not under general anesthesia.

Grade 3 b: Intervention under general anesthesia.

Grade 4: Life-threatening (complication including those affecting the brain) requiring intensive care management.

Grade 4 a: Single organ dysfunction (including dialysis)

Grade 4 b: Multi organ dysfunction.

Grade 5: Death of patient

In Lichtenstein repair usually grade 1,2 and 3 complications are reported in our study. Grade 4 and 5 complications are not usually encountered.

The postoperative complications in Lichtenstein repair is usually divided into early and late postoperative complications. The early post operative complications are postoperative pain, urinary retention, postoperative

bleeding, hematoma, seroma and wound infection late postoperative complications are recurrence ,chronic postoperative pain, postoperative neuralgias and testicular atrophy.

METHODS

In surgical ward of our hospital, I have conducted a prospective cohort study which is both qualitative and quantitative. The objective of research study was to see the impact of accurate defect size estimation and overlapping of mesh on postoperative complications in Lichtenstein repair. I have selected 194 patients of direct and indirect inguinal hernia through consecutive sampling and divided into two groups F1 and F2 .In first group F1, I have estimated accurate defect size through European hernia society (EHS) and in group F2 ultrasound and EHS classification is used for determination of defect size in inguinal hernia .Post-operative complications in both group have been evaluated upto three months in both groups.

RESULTS

According to our results, we found that out of the 97/194 patients in the F1 group, 51 have lateral inguinal hernia and 41 have medial inguinal hernia. In the F2 group, 43 patients have lateral inguinal hernia, and 49 patients have medial inguinal hernia.

Table No.1: Postoperative complications.

Postoperative complications	F1	F2	Analysis	Treatment
1)hematoma	47	07	P:0.001, OR:13.67, 95%CI:5.753,32.51, Kappa:0.443	Conservative, guided drainage, and antibiotics
2)wound infection	63	07	P:0.001, OR:26.11, 95%CI:10.85,62.82,kappa:0.598	Conservative, antibiotics anti-inflammatory
3)Postop pain	64	07	P:0.001, OR:23.68, 95%CI:10.22,54.86 kappa:0.598	Conservative analgesics anti-inflammatory
4)postop neuralgia	60	07	P:0.001, OR:43.83, 95%CI:17.74,108.24,kappa:0.701	Analgesic gabapentin
5)recurrence	01	00	-	Observation surgical management
6)Testicular atrophy	01	00	-	Observation

Postoperative Complications In:

1) Haematoma:

group * haematoma Cross tabulation Count				
		Count		
		haematoma		Total
		yes	no	
group	f1=no	50	47	97
	f2=yes	7	90	97
Total		57	137	194

F1 Group: 50 patients developed haematoma in the early postoperative period resolved conservatively.

F2 group: 07 patients developed haematoma resolved conservatively.

Statistical analysis:

P-value: 0.001

Odd's Ratio: 13.67

95% Confidence interval: 5.75,32.51,kappa:0.443

2) Wound infection:

Group * wound infection Cross tabulation Count				
		Wound Infection		Total
		yes	no	
group	f1=no	65	32	97
	f2=yes	7	90	97
Total		72	122	194

F1 group: 65 patients developed wound infection in F1 group which are treated conservatively by daily dressing, antibiotics and anti-inflammatory medication. The most common organisms found are staphylococcus aureus, Ecoli, and klebsiella.

F2 group: 07 patients developed wound infection treated. Mostly are superficial surgical site infection treated conservatively with daily dressing and antibiotics.

Statistical analysis:

P value: 0.001

Odds ratio: 26.11

95% confidence interval: 10.85,62.82, kappa:0.598

3) Postoperative Pain:

group * postoperativepain Crosstabulation				
Count		postoperativepain		Total
		pain	no pain	
group	f1=no	66	31	97
	f2=yes	8	89	97
Total		74	120	194

F1 group: 66 patients have mild to moderate pain in first 10 days with paper based VAS (visual analog score) for pain is 4-8.^{11,13}

No patient developed pain till 03 months.

All the patients treated conservatively.

F2 group: 08 patients had mild to moderate pain with paper based VAS (visual analog score) was 4-8.^{11,4}

Statistical Analysis:

P value:0.001

Odds Ratio:23.68

95% Confidence interval:10.22,54.86,kappa:0.5998.

4) Postoperative Neuralgia:

F1 group: 64 patient had complains of postoperative neuralgia (pricking, numbness, burning at surgical site and in groins, spinal headache. Treated conservatively with anti inflammatory, analgesics and gabapentin.

F2 group: 08 patients developed postoperative neuralgias for 10 days upto 01 month treated conservatively with anti-inflammatory ,spinal headache with caffeine, cola drinks and gabapentin.

Statistical Analysis:

P-value:0.001.

Odds ratio:21.57.

95% Confidence interval:9.34,49.80.kappa:0.577.

5) Testicular atrophy: Only 01 patient reported in F1 group

6) Recurrence: Only 01 patient reported in F1 group.

In our study many patients who developed complications have Lichtenstein repair done by postgraduate surgeons under supervision and by surgical registrars. The lichtenstein repair on patients carried out by experienced surgeon have developed negligible or less complications. The level of experience noted should be >300 lichtenstein repair. Combination of ultrasound and EHS classification is found to be sensitive in reducing post-operative complications by accurate estimation of defect size and with the help of this junior as well as senior surgeons can plan to overcome the incident alomas and intra and postoperative complications¹⁴.

DISCUSSION

Inguinal hernia has been the disease ever since the mankind existed¹.04 decades before Lichtenstein developed a state of art tension free mesh repair known as Lichtenstein Repair¹. In the year 2004, European hernia society annual meeting held in Capri, Italy in which the standard inguinal hernia classification system was orchestrated. In this simple and comprehensive classification of hernia¹⁵ in which direct, indirect and femoral hernia were marked and defect size will be evaluated by taking index fingerbreadth as a criteria of measurement. Ultrasound helps in diagnosing occult inguinal hernia¹⁶.Significance of clinically hard inguinal hernia with help of ultrasound is confirmed by European hernia society.

A European study led by Mathews proposed that in patients with normal or doubtful clinical examination, the preoperative ultrasound can be considered diagnostic for evaluation. It is now affirmed that ultrasound has high accuracy in the diagnosis of inguinal hernia including differentiating the type of hernia in doubtful cases. Post-operative complications in tension free mesh repair is still the problem in Lichtenstein repair. In one study 12 % cases of different post-operative complications were identified in Lichtenstein repair⁶.

The most common post-operative complication world wide in open inguinal hernia repair is recurrence but due to major advances and expertise it is declining. Other post-operative complications such as wound infection, urinary retention, haematoma¹⁷,seroma, postoperative pain , postoperative neuralgia, testicular atrophy is also present. In my study, I found 54(27%) patient developed haematoma¹⁷,70(36%) patient developed wound infection⁵, postoperative pain⁵ is present in 70(36%) of cases mostly pain of short duration , no case of chronic postoperative pain¹⁹ was reported in the duration of study all cases were managed conservatively,

In this study, 67(34%) cases of postoperative neuralgia were reported included patients having mild pricking, burning sensation of short duration in the area of nerve distribution all treated conservatively. Common nerves

encountered in Lichtenstein repair are three Ilioinguinal nerve, genital branch of genitofemoral nerve and iliohypogastric nerves. Cases of spinal headache due to inappropriate spinal anesthesia were also reported and increased the length of stay. Approximately 38(20%) cases of spinal headache were reported in our study. All cases were treated conservatively. Cases of urinary retention were 6(3%) also found in the duration of study. 01 patient of testicular atrophy and 01 patient of recurrence²⁰ were reported in duration of our study. In this study I found Lichtenstein repair done by expert surgical hands causing less complications. The level of experience should be >300 lichtenstein repairs. Many risk factors were associated with development of postoperative complications in this study including age²¹, intercurrent illnesses, lack of expertise of surgeons and anesthetist, inappropriate suture material, fixation of mesh over the edge which should be 0.5 cm away from edge, improper closure technique by junior surgeons. The author concluded that use of spinal anaesthesia in elderly patient is not supported by existing evidence.

CONCLUSION

Accurate estimation of defect size, adequate spinal anesthesia with experienced anesthetist, proper fixation and overlapping of mesh, Availability of proper suture material, and instruments with proper lightning and sterilisation techniques, surgical expertise can reduce postoperative complications in Lichtenstein repair.

Author's Contribution:

Concept & Design of Study: Muhammad Fahad
 Drafting: Muhammad Fahad
 Data Analysis: Muhammad Fahad
 Revisiting Critically: Muhammad Fahad
 Final Approval of version: Muhammad Fahad

Conflict of Interest: The study has no conflict of interest to declare by any author.

Source of Funding: None

Ethical Approval: No.11/22 dated 27.04.2022

REFERENCES

1. Panda R, Pradhan A, Hembram P. Complications of Prosthetic Mesh repair (Lichtenstein Method) of uncomplicated inguinal hernia of male patients: An Observational Prospective study. *JMSH* 2020;6(3): 66-73.
2. Antonisamy B, Prasanna S. Premkumar, Solomon Christopher, Sample size, Principles and Practice of Biostatistics. RELX India private limited 2017,324-326.
3. Kockerling F, Maarten P. Simons, Current concepts of inguinal hernia repair. *Visc Med* 2018;34(2):145-150.

4. Jan Z, Ali S, Ahmed N, Sarwar MA. Comparison of common Postoperative Complications between Lichtenstein open repair and Laparoscopic Transabdominal Pre-peritoneal (TAPP) Repair for unilateral inguinal hernia. *Cureus* 2021; 13(9):e17863.
5. Assakran B, AlHarbi AM, Abdulrahman Albadrani H, Al-dohaiman RS. Risk factors for postoperative complications in Hernia repair. *Cureus* 2024;16(1):e511982.
6. Vasu S, Sagar K. A clinical study of postoperative complications of Lichtenstein hernioplasty for inguinal hernia. *Int Surg J* 2018. <http://doi.org/10.18203/2349-2902.isj20185457>.
7. Eylert G, Wolfsberger C, Meik R, Winter F, Dong R, Michelitsch S, et al. The Postsurgical Clavien-Dindo classification in minor surgery can improve perception and communication (Investigation on blepharoplasty). *J Pers Med* 2022;1900.
8. Rapaka RR, Venkata Reddy M. A study on assessment of postoperative complications among major abdominal surgeries using Clavien-Dindo classification. *IJS* 2020; 7(6). <http://doi.org/10.18203/23492902.isj20202382>.
9. Kapoor VK. Open inguinal hernia repair, Clinical procedures. *Drugs Dis* April 18th, 2023. www.emedicine.medscape.com/article/1534281.
10. Kingsnorth A, Sanders DL. General introduction and History of hernia surgery. *Management of Abdominal hernias* 2018;17:3-30. http://doi.org/10.007/978-3-319-63251-3_1.
11. Delgado DA, Lambert BS, Boutris N, McCulloch PC, Robbins AB, Moreno MR, et al. Validation of Digital Visual Analog Scale Pain Scoring with a Traditional paper-based visual analog scale in adults. *J Acad Orthop Surg Glob Res Rev* 2018. <http://doi:10.5435/JAAOSGlobal-D-17-00088>.
12. Valappil RK, Ramamoorthy J, Krishan S. Early Postoperative complications of Emergency Lichtenstein. *Hernioplast* 2017;5:11.
13. Sooyoung Cho, Youn Jin Kim, Lee M, Woo JH, Lee HJ. Cut off points between pain intestines of the postoperative pain using receiver operating characteristic curves (ROC). *BMC Anaesthesiol* 2021;21(1):29.
14. Pierce RA, Paulose BK. Preoperative imaging in hernia surgery. In: Novilsky YW, editor. *Hernia surgery. Current principles*. Switzerland: Springer Cham;2016.p.23-30.
15. Simons MP, Aufenacker T, Bay-Nielsen M. et al. European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. *Hernia* 2009;13:343-403.
16. Plumb AA, Rajeswaran G, Abbasi MA, Masci L, Warren O, Wilson J, Contemporary imaging of inguinal hernia and pain. *Br J Radiol* 2022; 95(1134). <http://doi.org/10.1259/bjr.20220163>.

17. Zeb MH, Pandian TK, El Khatib MM, Naik ND, Chandra A, Morris DS, et al. Risk factors for postoperative haematoma after inguinal hernia repair: an update. *J Surg Res* 2016;205(1),33-37.
18. Pangal HN, Prashanth Kumar K. A study of post-surgical complications of inguinal hernia, *Int J Surg Sci* 2020;4(3):277-278.
19. Reinbold W. Risk factors of chronic pain after inguinal hernia repair. A systematic review. *Innov Surg Sci* 2017;2(2):61-68.
20. Abdourahmane N, Diallo Adja C, Diao Mohamed L, Tendeng Jacques N, Nyemb Philippe MM, Mamadou C, et al. Acute Postoperative complications increase the risk of recurrence and chronic pain after inguinal hernia surgery. A single-center retrospective analysis. *Int J Abdominal Wall Hernia Surgery* 2023;6(4): 236-241.
21. Kockerling F. Data and outcome of inguinal hernia repair in hernia registers-a review of literature. *Innov Surg Sci* 2017;2(2):69-79.