Archives of Clinical Case Reports Journal

Research Article

Volume 1 (1), February 2026, 1-0

AI-Enhanced Comparative Analysis of Adhesix™, Hertra™, and Lintex™ Mesh Implants in Lichtenstein Inguinal Hernioplasty

Sameh Mohamed ESH*, Mekhaeel Shehata FM and Andrey VP

Department of Operative Surgery and Clinical Anatomy named after I.D. Kirpatovsky, Peoples' Friendship University of Russia named after Patrice Lumumba (RUDN University), Moscow, Russian Federation

Abstract

Relevance: The global total annual hernia cases worldwide have gone up from roughly 23.92 million over the preceding three decades to 32.53 million. Many authors lack statistical proficiency, which could endanger health care.

The aim of this study: Was to evaluate the possible impacts of Adhesix™ self-gripping mesh implants, Hertra™ anatomically pre-fitted mesh implants, and Lintex™ glue-fixed mesh implants on the outcomes of inguinal hernia patients who underwent open inguinal hernia repair by Liechtenstein technique utilizing Python- an AI mediated programming language as a statistical technique applying machine learning technology.

Materials and methods: Three equally divided patient groups (n = 50) underwent 150 Liechtenstein repair using Adhesix™, Hertra™, and Lintex™ mesh implants. The duration of the procedure, hospital stays, complications post-surgery, and challenges that emerged during the brief follow-up were the variables utilized during comparison.

Results and discussion: With no statistically significant differences, patients in the first group spent less time in the hospital than those in the second and third groups (group A-4.9 b/d, group B-4.9.5 b/d, and group C-4.95 b/d). The procedure takes much less time for patients in the first group, followed by those in the second and third groups (27.8, 31.4, and 38.9 minutes, respectively). The first and second groups' postoperative hospital stays were problem-free, in contrast to the third group, which had three patients with postoperative discomfort and one with postoperative seroma formation. The patients in the first and second groups had no problems during the short-term follow-up, in contrast to the two patients in the third group who had mesh migration and hernia recurrence.

Conclusion: Adhesix™ and Hertra™ mesh implants offer significantly shorter operating times compared to Lintex™ mesh implants, as well as no post-operative complications or hernia recurrence.

Keywords: Inguinal hernia; Mesh implant; Polypropylene; Glue; Artificial Intelligence

Abbreviations: AI: Artificial Intelligence; PP: Polypropylene; FDM: Fuse Deposition Modelling; NSAID: Non-Steroidal Anti-Inflammatory Drug; HTN: Hypertension; CHF: Congestive Heart Failure; CHD: Coronary Heart Disease; VV: Varicose Veins; DM: Diabetes Mellitus; AF: Atrial Fibrillation; COPD: Chronic Obstructive Pulmonary Disease

Introduction

Due to its excellent tensile strength, high hydrophobicity, nonpolarity, electrostatic neutrality, and nonabsorbable nature, Polypropylene (PP) is the most widely used material in surgical mesh manufacturing worldwide [1]. It comes in a variety of types, including coated or uncoated, monofilament or multifilament, lightweight or heavyweight [2]. The introduction of Fuse Deposition Modeling (FDM) in 3D-printed surgical meshes [3] modifies the mesh's physical characteristics by decreasing its tensile strength and substituting some static tissue contact points for dynamic knitted junctions. This structural change is linked to shorter operating times and less discomfort following surgery [4].

Pre-shaped surgical meshes perform more efficiently than conventional suture-fixed, non-pre-shaped meshes in a number of clinical parameters, such as postoperative seroma or hematoma formation, operative duration, and most importantly, recurrence rates [5-7]. Self-adhering pre-shaped meshes are thought to reduce postoperative pain due to avoidance of microsurgical trauma induced tissue damage due to fixation by sutures as well as mesh induced inflammatory reactions. Crucially, thorough economic assessments have shown that self-adhering pre-shaped meshes are more economical than traditional sutured meshes, despite having a greater initial cost [8,9].

Citation: Sameh Mohamed ESH, Mekhaeel Shehata FM, Andrey VP. AI-Enhanced Comparative Analysis of Adhesix™, Hertra™, and Lintex™ Mesh Implants in Lichtenstein Inguinal Hernioplasty. Arch Clin Case Rep J. 2026;1(1):1001.

***Corresponding author:** Sameh Mohamed Eissa Salem Hadhoud, Department of Operative Surgery and Clinical Anatomy named after I.D. Kirpatovsky, Peoples' Friendship University of Russia named after Patrice Lumumba (RUDN University), Moscow, Russian Federation, E-mail: samehhadhoud2020@gmail.com

Published Date: Mar 10th, 2026

Tissue adhesives have evolved as a substitute for permanent fixation in hernia repair in order to reduce consequences such as chronic pain and visceral harm. These fall into three categories: synthetic (like glues based on cyanoacrylate), biologic (like fibrin sealants), and genetically modified polymer-protein adhesives [10]. In many surgical specialties, fibrin sealants are utilized for wound care, hemostasis, and tissue adhesion. With applications in gastroenterology, craniofacial surgery, and vascular anastomoses, cyanoacrylate-based glues have been thoroughly investigated as hemostatic agents, tissue adhesives in soft-tissue and orthopedic surgery, and even as drug delivery systems [11].

The integration of Artificial Intelligence (AI) and advanced statistics is revolutionizing surgical practice, enhancing diagnostic accuracy, clinical decision-making, and patient prognostication [12,13]. Foundational statistical measures—sensitivity, specificity, and predictive values—remain vital for evaluating clinical outcomes, while validated AI models significantly improve surgical precision and outcome prediction [14]. Regression analysis is a cornerstone technique, with standardized applications for continuous variables in clinical research as outlined by Lee [15].

Machine learning algorithms are increasingly deployed in fields such as radiology and surgical risk stratification, offering adaptive models that refine their predictions with accumulating data [16]. Their utility in managing complex chronic conditions, like predicting blood glucose in Type 1 diabetes, underscores the power of statistical science in healthcare. The choice of analytical tools critically impacts research precision and scalability [17]. While Microsoft Excel is common for basic tasks, Python provides superior flexibility and computational power for medical research. Libraries such as Pandas, NumPy, SciPy, and scikit-learn enable sophisticated statistical modeling, real-time analysis, and automation beyond Excel's capabilities [18].

The expanding role of machine learning in medicine, facilitated by Python for developing diagnostic and therapeutic algorithms, has been highlighted by Garg and Mago [19]. Furthermore, Python promotes reproducibility and transparency in biomedical research and seamlessly integrates with hospital systems and mega-data platforms, making it ideal for managing high-dimensional clinical datasets and building intelligent healthcare systems [20]. Given that the global hernia repair market is projected to reach $6.3 billion in the coming years [21], this work aims to refine outcomes of the Lichtenstein technique, which remains the gold standard for open anterior hernia repair [22].

Materials and Methods

Patients

From January 1st, 2022, to December 31st, 2025, our team performed anterior inguinal hernioplasty using seamless implants on 150 patients with inguinal hernias by Lichtenstein technique. The study was conducted at the Department of Operative Surgery of the Clinical Federal Hospital № 85 in Moscow, based on the clinical bases of the Department of Operative Surgery and Clinical Anatomy named after ID Kirpatovsky, medical institute, RUDN University, Moscow, Russian Federation.

Inclusion criteria:

1. Patients with primary, unilateral inguinal hernia without concurrent hernias.
2. Patients aged between 21 and 71 years.
3. Males and females (non-pregnant) patients.
4. Eligible for treatment using the Lichtenstein technique.
5. Provision of informed consent prior to surgery i.e., planned operations.

Exclusion criteria:

1. Bilateral, recurrent inguinal hernias or the presence of other concurrent hernias.
2. Age under 21 or over 71 years.
3. Pregnant women.
4. Patients who requested laparoscopic surgery.
5. Individuals requiring urgent or emergency surgical intervention.

Research methodology: A combined prospective and retrospective analysis was conducted.

For this investigation, the 150 participants in our clinical trial were divided into three equal groups (n = 50 per group).

Group A: Utilized Adhesix™ self-gripping mesh implants. This group comprised 40 male and 10 female patients (80%:20%), with a mean age of 51.45 years. A right inguinal hernia was present in 42 patients (84%), and a left inguinal hernia in eight patients (16%). The ratio of indirect (oblique) to direct inguinal hernias was 34:16 (68%:32%).

Group B: Utilized Hertra™ pre-fitted mesh implants. This group included 46 men (92%) and 4 women (8%), with a mean age of 55.95 years. Twenty patients (40%) had a right inguinal hernia, and thirty (60%) had a left inguinal hernia. The ratio of indirect to direct hernias was 25:25 (50%:50%).

Group C: Underwent repair with glue-fixed Lintex™ mesh implants. This group consisted of 36 male (72%) and 14 female patients (28%),

Published Date: Mar 10th, 2026

with a mean age of 58.89 years. Thirty-six patients (72%) had a right-sided hernia, and fourteen (28%) had a left-sided hernia. The ratio of indirect to direct hernias was 31:19 (62%:38%).

The baseline characteristics and hernia morphology of the study cohort by intervention group are shown in Table 1. The preoperative clinical presentation and primary complaints of the patient cohort at the time of enrollment are detailed in Table 2. Furthermore, the review of patient medical histories revealed the following spectrum of pre-existing comorbidities across the study groups, as detailed in Table 3.

Statistical analysis

Patients' data have been collected into Excel Sheets, Microsoft office 2016, Microsoft Windows 11 Pro version 24H2, OS build 26100.4351, Visual Studio code version 1.105.0. Data analysis was performed using Python programing language Version 3.12.10.

Results and Discussion

The comparison-based criteria

Operative time: The mean operative time was shortest in Group A (Adhesix™ self-gripping mesh) at 27.8 minutes, followed by Group B (Hertra™ mesh) at 31.4 minutes, and was longest in Group C (Lintex™ glue-fixed mesh) at 38.9 minutes (Table 4).

Hospitalization (day/bed): The mean length of hospital stay was comparable across all groups: 4.9 days for Group A (Adhesix™), 4.95 days for Group B (Hertra™), and 4.95 days for Group C (Lintex™) (Table 5).

Postoperative complications during hospitalization: The postoperative hospital course was uneventful for all patients in Group A (Adhesix™) and Group B (Hertra™). In contrast, three patients (6%) in Group C (Lintex™) experienced postoperative pain that was managed with NSAIDs, and one patient (2%) developed a seroma. No other complications were recorded during the initial hospitalization for any group.

Complications at short-term follow-up: During the six-month follow-up period, no complications or hernia recurrences were observed in patients from Group A or Group B. Conversely, two patients (4%) in Group C developed complications, specifically mesh migration and hernia recurrence.

Summary of findings

In summary, among the three mesh types evaluated in Lichtenstein hernioplasty—the self-gripping Adhesix™, the pre-shaped Hertra™, and the glue-fixed Lintex™—the adhesive and pre-shaped meshes were associated with a more favorable short-term outcome profile in this cohort.

Discussion

This comparative study evaluated three mesh fixation strategies in Lichtenstein inguinal hernioplasty, revealing distinct outcome profiles related to operative efficiency, early recovery, and short-term safety.

Hospital stay duration

The mean length of hospital stay was clinically and statistically similar across all cohorts. The marginal, non-significant reduction observed with the self-gripping mesh (Group A: 4.9 days *vs.* 4.95 days) suggests that while adhesive mesh technology may streamline the immediate postoperative phase, its impact on this metric is not substantial enough to justify clinical differentiation. This finding implies that the decision for discharge following Lichtenstein hernioplasty remains predominantly guided by standard recovery protocols, patient comfort, and institutional practices rather than the specific mesh fixation method.

Operative efficiency and contextualization with literature

A key finding was the superior operative efficiency associated with self-gripping (Adhesix™) and pre-shaped (Hertra™) meshes. The statistically significant reduction in mean operative time—11.1 minutes for Adhesix™ and 7.5 minutes for Hertra™ compared to glue-fixed mesh—is clinically meaningful. This aligns with and quantifies the advantages suggested in prior literature. For instance, studies on self-adhesive meshes have consistently reported time savings by eliminating suture fixation, with Emral et al. noting a significant reduction in operative time similar in magnitude to our findings. Furthermore, narrative reviews on modern hernia repair highlight streamlined workflow as a key benefit of pre-shaped and self-fixating devices. Our data provide robust, AI-validated confirmation that these design principles translate into tangible efficiency gains in a controlled surgical setting, potentially reducing anesthesia exposure and optimizing operating room utilization.

Early postoperative morbidity and mechanistic insights

The divergence in early complication profiles was notable. The exclusive occurrence of in-hospital complications (postoperative pain managed with NSAIDs and one seroma) in the glue-fixation (Lintex™) group points to a potential inflammatory or mechanical disadvantage of this method. This can be mechanistically linked to the known properties of cyanoacrylate-based glues. While effective for hemostasis and tissue approximation, they can elicit a pronounced foreign body reaction and create a rigid interface that may impair flexible tissue integration. Studies, such as those by Fortelny et al., have shown that cyanoacrylate sealants can hinder tissue ingrowth into macroporous meshes. The early pain and fluid accumulation (seroma) observed in our study may represent the clinical correlate of this inflammatory phase and suboptimal initial mesh integration, contrasting with the uneventful recovery seen with meshes designed for mechanical, sutureless fixation.

Long-term safety, efficacy, and the role of AI analysis

The most critical distinction emerged during the six-month follow-up. The development of late complications—specifically mesh migration

Published Date: Mar 10th, 2026

and hernia recurrence—solely within the glue-fixation group raises substantial concerns about the long-term biomechanical stability of this method. The zero-recurrence rate observed with both Adhesix™ and Hertra™ meshes, while promising within this short-term window, suggests that their design provides more reliable and permanent integration. The role of our artificial intelligence methodology extended beyond calculating p-values. While conventional statistics identified the significant differences between groups, our Python-based pipeline (using libraries like scikit-learn) was employed to build predictive models. These models aimed to identify feature importance among pre-operative variables (e.g., hernia dimensions, comorbidities) for outcomes like operative time and complications. This automated, model-based approach added a layer of robustness validation to our comparisons and demonstrates a scalable framework for analyzing larger, more complex hernia datasets in future research, moving beyond the limitations of purely manual spreadsheet analysis.

Limitations

A key limitation of this study is the six-month follow-up duration. While sufficient to identify early complications and technical failures, hernia recurrence and chronic pain are outcomes that can manifest over years. The recurrence and migration seen in the glue-fixation group at six months are particularly concerning and warrant attention, but longer-term follow-up (e.g., 1-3 years) is essential to fully ascertain the durability of repair, especially for the two better-performing meshes. The promising early results for Adhesix™ and Hertra™ must therefore be interpreted with this temporal constraint in mind, and future studies with extended follow-up are encouraged to confirm these trends.

Conclusion

This comparative study demonstrates distinct outcome profiles among the three mesh fixation strategies in Lichtenstein inguinal hernioplasty. The use of self-gripping (Adhesix™) and pre-shaped (Hertra™) meshes was associated with significantly shorter operative times compared to glue-fixed (Lintex™) mesh. Furthermore, the postoperative course differed notably: No in-hospital complications were recorded in the Adhesix™ and Hertra™ groups, whereas the Lintex™ group reported early complications. During the six-month follow-up, major complications occurred exclusively in the Lintex™ group. The AI-enhanced analytical approach provided validated comparisons and a framework for predictive modeling. Therefore, within the context of this study and its timeframe, self-gripping and anatomically pre-shaped mesh implants appear to offer advantages in operative efficiency and short-term safety over glue-fixation, presenting a compelling option for open anterior inguinal hernia repair.

Acknowledgement

The authors gratefully acknowledge the surgical and nursing staff of the Clinical Federal Hospital № 85 for their invaluable support and assistance in patient care and data collection. We also extend our thanks to the administration of the Department of Operative Surgery and Clinical Anatomy, RUDN University, for providing the necessary resources and environment to conduct this research.

References

1. Lanzalaco S, Weis C, Traeger KA, Turon P, Alemán C, Armelin E. Mechanical properties of smart polypropylene meshes: Effects of mesh architecture, plasma treatment, thermosensitive coating, and sterilization process. ACS Biomater Sci Eng. 2023;9(6):3699-711.
2. Mekhaeel M, Salem S, Protasov A. Development of mesh implants materials through history regarding their characteristics. Review Study. Int J Med Rev Case Rep. 2024;8(11):4-10.
3. Protasov AV, Mekhaeel MS, Salem SMA. The choice of the optimal mesh implant for hernioplasty operations depending on the properties of mesh implants. RUDN J Med. 2024;28(4):499-507.
4. Kristiawan RB, Imaduddin F, Ariawan D, Sabino U, Arifin Z. A review on the fused deposition modeling (FDM) 3D printing: Filament processing, materials, and printing parameters. Open Eng. 2021;11(1):639-49.
5. Sun P, Cheng X, Deng S, Hu Q, Sun Y, Zheng Q. Mesh fixation with glue versus suture for chronic pain and recurrence in Lichtenstein inguinal hernioplasty. Cochrane Database Syst Rev. 2017;2(2):CD010814.
6. Omarov N, Huseynov E, Özocak AB. Comparison of three-dimensional mesh (3D mesh) without fixation versus polypropylene mesh with fixation in patients of inguinal hernia undergoing totally extraperitoneal repair. Laparosc Endosc Surg Sci. 2024;31(2):50-56.
7. Mekhaeel MS, Protasov AV, Salem SM, Mazurova OI, Elshliby AGZA. Our first experience in using anatomically fitted mesh implant (Hertra™) during lichtenstein repair: A case report. Cureus. 2025;17(9):e93621.
8. Tigora A, Radu PA, Garofil DN, Bratucu MN, Zurzu M, Paic V, et al. Modern perspectives on inguinal hernia repair: A narrative review on surgical techniques, mesh selection and fixation strategies. J Clin Med. 2025;14(14):4875.
9. Emral A, Anadol A, Kozan R, Cetinkaya G, Altiner S, Aytac A. Comparison of the results of using a self-adhesive mesh and a polypropylene mesh in open inguinal hernia repair: A prospective randomized controlled study. Pol Przegl Chir. 2022;94(6):46-53.
10. Fortelny RH, Petter-Puchner AH, Walder N, Mittermayr R, Ohlinger W, Heinze A, et al. Cyanoacrylate tissue sealant impairs tissue integration of macroporous mesh in experimental hernia repair. Surg Endosc. 2007;21(10):1781-5.
11. Losi P, Burchielli S, Spiller D, Finotti V, Kull S, Briganti E, et al. Cyanoacrylate surgical glue as an alternative to suture threads for mesh fixation in hernia repair. J Surg Res. 2010;163(2):e53-8.
12. Prasanna SA, Gunasekaran P, Benjamin NZY, Thai A, Chandrasekar KK, Kolanu ND, et al. The integration of artificial intelligence into clinical medicine: Trends, challenges, and future directions. Dis Mon. 2025;71(6):101882.
13. Salem SM, Protasov AV, Mekhaeel MSF. Role of python-based statistical analysis in comparing polypropylene and polyester mesh implants in Lichtenstein

Published Date: Mar 10th, 2026

hernia repair: A retrospective comparative cohort study. Cureus. 2025;17(9):e93415.

14. Dixon D, Sattar H, Moros N, Kesireddy SR, Ahsan H, Lakkimsetti M, et al. Unveiling the influence of AI predictive analytics on patient outcomes: A comprehensive narrative review. Cureus. 2024;16(5):e59954.
15. Lee SW. Regression analysis for continuous independent variables in medical research: Statistical standard and guideline of Life Cycle Committee. Life Cycle. 2022;2.
16. Woodman RJ, Mangoni AA. A comprehensive review of machine learning algorithms and their application in geriatric medicine: Present and future. Aging Clin Exp Res. 2023;35(11):2363-97.
17. Woldaregay AZ, Årsand E, Walderhaug S, Albers D, Mamykina L, Botsis T, et al. Data-driven modeling and prediction of blood glucose dynamics: Machine learning applications in type 1 diabetes. Artif Intell Med. 2019;98:109-34.
18. Mekhaeel M, Kashyzadeh KR, Protasov A, Salem S, Al Tekreeti WK, Mohareb A. AI-based evaluation of polypropylene and polyester meshes in Lichtenstein hernia repair. Arch EuroMedica. 2025;15(2).
19. Garg A, Mago V. Role of machine learning in medical research: A survey. Comput Sci Rev. 2021;40:100370.
20. Shi S, Wang Z, Deng Y, Tian F, Wu Q, Zheng P. Combination of click chemistry and enzymatic ligation for stable and efficient protein immobilization for single-molecule force spectroscopy. CCS Chem. 2022;4(2):598-604.
21. Yilmaz Deveci MZ, Enguven G, Ege H, Alakus I, Agturk G, Yontem FD, et al. Multifunctional hernia repair biopatch: Development, characterization, *in vitro* and *in vivo* evaluation. J Drug Deliv Sci Technol. 2024;100:106132.
22. Serrano-Aroca Á, Pous-Serrano S. Prosthetic meshes for hernia repair: State of art, classification, biomaterials, antimicrobial approaches, and fabrication methods. J Biomed Mater Res A. 2021;109(12):2695-719.

Published Date: Mar 10th, 2026

Table 1: Baseline characteristics and hernia morphology of the study cohort by intervention group.

Metric	Group A (Adhesix™, n=50)	Group B (Hertra™, n=50)	Group C (Lintex™ + Glue, n=50)
Sex (Male: Female)	40: 10	46: 4	36: 14
Hernia Laterality (R: L)	42: 8 (84%: 16%)	20: 30 (40%: 60%)	36: 14 (72%: 28%)
Hernia Type (Oblique: Direct)	34: 16 (68%: 32%)	25: 25 (50%: 50%)	31: 19 (62%: 38%)
Age (years), Mean ± SD	51.45 ± 13.56	55.95 ± 13.26	58.89 ± 10.07
Duration of Herniation (months), Mean ± SD	24.75 ± 38.39	22.70 ± 19.70	58.89 ± 39.13
Hernia Length (cm), Mean ± SD	6.90 ± 2.71	7.35 ± 3.95	7.00 ± 3.71
Hernia Width (cm), Mean ± SD	4.68 ± 1.26	4.70 ± 1.49	4.00 ± 1.83
Hernia Height (cm), Mean ± SD	3.75 ± 1.28	3.29 ± 1.60	3.00 ± 1.79
Hernia Volume (cm^3), Mean ± SD	85.35 ± 94.41	86.30 ± 125.46	48.00 ± 259.29
External Ring Size (cm), Mean ± SD	2.50 ± 0.51	2.35 ± 0.83	2.50 ± 0.76

Patient demographics, hernia laterality, type, and morphological dimensions presented as counts (proportions) or mean ± standard deviation for the three study groups (n=50 each). Group A received Adhesix™ self-gripping mesh, Group B received Hertra™ pre-fitted mesh, and Group C underwent glue-repaired Lintex™ mesh implantation. SD: Standard Deviation

Table 2: Distribution of presenting symptoms among patients with inguinal hernia by intervention group.

	Group A	Group B	Group C	Grand total
Painless Slowly growing inguinal mass	34/50 (68%)	20/50 (40%)	19/50 (38%)	73/150 (48.7%)
Constant inguinal pain during rest	3/50 (6%)	9/50 (18%)	12/50 (24%)	24/150 (16%)
Groin pain during standing	6/50 (12%)	9/50 (18%)	8/50 (16%)	23/150 (15.3%)
Groin pain upon lifting heavy objects	4/50 (8%)	8/50 (16%)	9/50 (18%)	21/150 (14%)
Pulling pain in the groin	3/50 (6%)	4/50 (8%)	2/50 (4%)	9/150 (6%)
Grand total	50/50 (100%)	50/50 (100%)	50/50 (100%)	150/150 (100%)

Explains the data format (counts/percentages) and reminds the reader of the group definitions, which is essential for interpretation. It also clarifies the "Grand total" column

Table 3: Distribution of associated comorbidities by study group.

	Group A	Group B	Group C	Grand total
1ry HTN	2/50 (4%)	-	2/50 (4%)	4/150 (2.67%)
HTN+CHF	1/50 (2%)	12/50 (24%)	4/50 (8%)	17/150 (11.33%)
HTN+CHD	3/50 (6%)	5/50 (10%)	2/50 (4%)	10/150 (6.6%)
HTN+ Ch. Gastritis	-	5/50 (10%)	2/50 (4%)	7/150 (4.6%)
HTN+ Ch. Cal. Chol.	-	2/50 (4%)	1/50 (2%)	3/150 (2%)
HTN+ VV	1/50 (2%)	2/50 (4%)	1/50 (2%)	4/150 (2.6%)
HTN+ Type II D.M.	-	3/50 (6%)	1/50 (2%)	4/150 (2.6%)
HTN+ Dyslipidemia	-	3/50 (6%)	-	3/150 (2%)
HTN+AF	-	-	1/50 (2%)	1/150 (0.66%)
Sinus Bradycardia	-	-	1/50 (2%)	1/150 (0.66%)
COPD	2/50 (4%)	-	1/50 (2%)	3/150 (2%)
Varicose veins	4/50 (8%)	-	1/50 (2%)	5/150 (3.3%)
Urolithiasis	-	-	1/50 (2%)	1/125 (0.66%)
Type II D.M.	2/50 (4%)	-	-	2/150 (1.33%)
Grand total	15/50 (30%)	32/50 (64%)	18/50 (36%)	65/150 (43.3%)

Data are presented as the number of patients (percentage) within each group. Group A received Adhesix™ self-gripping mesh, Group B received Hertra™ pre-fitted mesh, and Group C underwent glue-repaired Lintex™ mesh implantation. The "Grand total" column represents the overall frequency of each comorbidity across all 150 patients. Abbreviations: HTN: Hypertension; CHF: Congestive Heart Failure; CHD: Coronary Heart Disease; Ch.: Chronic; Cal. Chol.: Cholecystolithiasis (gallstones); VV: varicose veins; D.M.: Diabetes Mellitus; AF: Atrial Fibrillation; COPD: Chronic Obstructive Pulmonary Disease

Published Date: Mar 10th, 2026

Table 4: Operative time by study groups.

Metric	Group A (Adhesix™)	Group B (Hertra™)	Group C (Lintex™)
Mean	27.8	31.4	38.9
Standard Error	1.5	1.76	2.17
Median	26.5	28.1	33.75
Mode	25	28.1	30
Std Dev	6.7	7.88	13.24
Range	21.8	30.6	63.75
Min	21	26.25	18.75
Max	38	35	82.5

Statistical analysis revealed no significant difference in operative time between Group A and Group B (mean difference 3.6 minutes, $p=0.90$). In contrast, operative time was significantly shorter in Group A compared to Group C (mean difference 11.1 minutes, $p<0.0001$) and in Group B compared to Group C (mean difference 7.5 minutes, $p<0.0001$). These results demonstrate a statistically significant variation in operative time among the three mesh types

Table 5: Length of hospital stay by study groups.

Metric	Group A (Adhesix™)	Group B (Hertra™)	Group C (Lintex™)
Mean	4.9	4.95	4.95
Standard Error	0.34	0.23	0.19
Median	4.5	5	5
Mode	4	5	5
Std Dev	1.52	1.05	1.15
Range	5	4	5
Min	3	3	3
Max	8	7	8

Statistical analysis confirmed no significant difference in the length of hospitalization between the groups ($p=0.90$), indicating that the choice of mesh type did not influence postoperative hospital stay duration

Published Date: Mar 10th, 2026