

## Results and Side Effects of Open Mesh Inguinal Hernia Treatment in a Rural Tertiary Care Hospital, in BMIMS Pawapuri, Nalanda, Bihar

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### Abstract

**Aim:** This study examines open mesh inguinal hernia repair at Rural tertiary care hospital, in BMIMS Pawapuri, Nalanda, Bihar to determine its efficacy and limitations in a resource-limited situation.

**Method:** The Surgery Department of Department of General Surgery, Bhagwan Mahavir Institute of Medical Sciences, Pawapuri, Nalanda, Bihar, from 20-7-2023 to 21-8-2024 conducted this cross-sectional study. The purposive sample chose 86 inguinal hernia patients who underwent open mesh surgery. All participants gave written consent before data collection. Patients having complete surgical records and follow-up data were studied. Patients under 18, those with chronic disorders including constipation, cough, or prostatism, and those with irreducible, blocked, or strangulated hernias were excluded. All participants provided demographic and clinical data, which was analyzed using MS Office.

**Result:** Most of the 86 patients were male (67.44%) and 51-65 years old (37.20%). 93.02% of patients had no intraoperative problems. Postoperative problems included numbness (26.41%), hematoma (24.52%), and scrotal edema (22.64%). A wound infection occurred in 3.77% of cases. Hernia recurrence occurred in 3.6% of patients, and 2.4% needed surgery.

**Conclusion:** A Rural tertiary care hospital, in BMIMS Pawapuri, Nalanda, Bihar had low rates of significant problems and recurrence after open mesh inguinal hernia surgery. Numbness and hematoma are typical after the operation, yet it works in resource-constrained environments. Improved surgical techniques and postoperative care could improve patient outcomes and satisfaction in similar scenarios.

**Keywords:** Open mesh inguinal hernia repair, Rural tertiary care hospital, Hernia surgery, Surgical outcomes

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### Introduction

One of the most common surgical operations done worldwide is inguinal hernia repair, and millions of people suffer from this prevalent condition for which there is no effective treatment.[1] Patient outcomes have significantly improved as a result of advances in surgical techniques and a greater comprehension of the anatomy and physiology of the inguinal canal. Inguinal hernia repair has changed significantly over the past 130 years, especially in the last ten years with the introduction of tension-free surgery, laparoscopic methods, and the creation of dedicated hernia clinics.[2] Tension-free mesh repair, which is already the norm in many nations, is gradually replacing traditional suture repair techniques. Numerous studies have demonstrated the benefits of mesh repair over suture repair, including lower rates of recurrence and

shorter recovery periods and hospital admissions.[3] In 1986, Lichtenstein presented his open mesh inguinal hernia repair method. Since then, the Lichtenstein technique—along with some modifications—has emerged as the most popular method because of its ease of use and capacity to deliver tension-free healing with excellent long-term results. Benefits of this approach include less recuperation time, less pain following surgery, an early return to regular activities, and a low recurrence rate.[4]

Open mesh inguinal hernia repair is now a mainstay in treating this common problem in rural tertiary care hospital in areas like Bihar, India, where healthcare resources are frequently scarce. This surgical technique uses a synthetic mesh to reinforce the fragile abdominal wall; this approach has

become popular since it produces better results than typical suture-based repairs.[5] This procedure's implementation in rural tertiary care hospital settings marks a substantial improvement in surgical care and offers a useful alternative for treating inguinal hernias in places where access to more sophisticated facilities may be limited.[6]

In these situations, the results of open mesh inguinal hernia repair are remarkable.[7] Research continuously demonstrates that the mesh technique gives a reduced rate of recurrence as compared to traditional repair techniques, which is especially important in settings with limited resources. Mesh repair improves patient quality of life and lowers the need for repeat surgeries, which lowers the total load on the healthcare system by offering long-lasting and efficient treatment.[8]

Furthermore, patients who have this operation typically recover more quickly and with less pain after surgery, which is vital in a rural tertiary care hospital since patients' ability to resume daily activities and employment is critical to their economic stability as well as their well-being.[9] Nonetheless, there are several difficulties with the open mesh inguinal hernia repair procedure used in rural tertiary care hospital. The procedure's complications may significantly affect patient outcomes and the way healthcare is provided in general.[10] Wound infections are a frequent consequence that are made worse by the sometimes-inadequate infection control procedures and the scarcity of cutting-edge medical products in these environments. These infections may result in longer recovery periods, higher medical expenses, and the requirement for extra treatments.[11] An additional consequence that may emerge and necessitate additional medical attention is related to the mesh itself and includes problems like migration, erosion, or chronic pain. Complex case management resources in rural tertiary care hospital may be scarce, making these problems more difficult to handle.[12]

Moreover, the results of procedures to correct hernias are influenced by the socioeconomic background of Bihar. Inadequate follow-up care is one of the challenges that patients in a rural tertiary care hospital may encounter. This can make it more difficult to manage postoperative complications and

have an impact on overall recovery.[13] Patients at a rural tertiary care hospital may not receive the same degree of advanced care as those in more developed regions due to the difference in access to healthcare resources between urban and rural communities.[14]

**Methodology**

**Study area**

The study was carried out in the surgical department at Department of General Surgery, Bhagwan Mahavir Institute of Medical Sciences, Pawapuri, Nalanda, Bihar, India between the 20-7-2023 to 21-8-2024 Using a purposive sampling technique, the patients were gathered.

**Inclusion and exclusion criteria**

Adults who had open mesh inguinal hernia surgery at rural tertiary care hospital in Bihar and who have complete surgical records and follow-up data accessible meet the study's inclusion criteria. Patients under the age of eighteen, those for whom the surgery is contraindicated, and those whose surgical records are insufficient are among the exclusion criteria. Participants' informed consent was also required for them to take part in the study.

**Procedure**

All the patients' clinical and demographic information was thoroughly recorded. During the first several months of the trial, the principal investigator or coprincipal investigator visited each site to make sure that study protocols were being followed. A pathologist, anesthesiologist, and surgeon made up an impartial committee that assessed whether therapy was connected to deaths and life-threatening complications.

**Data analysis**

The statistical analysis will use SPSS 27. We'll use a student's t-test to compare mean values amongst parametric distribution groups. Use the Chi-square test for categorical data. Statistical significance requires a p-value below 0.05.

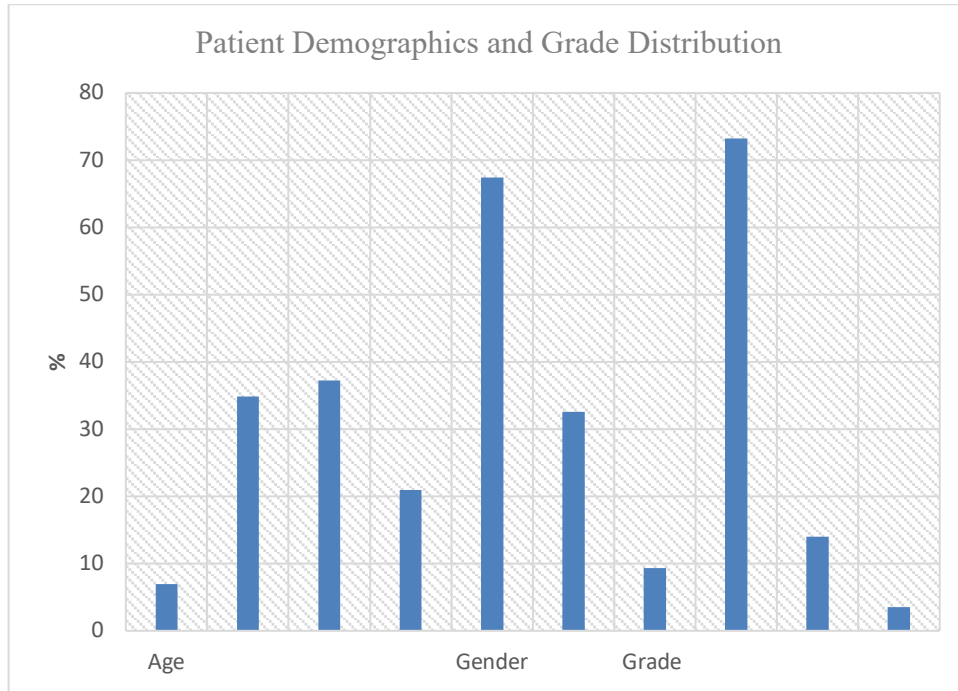
**Result**

**Table: 1.1 Patient Demographics and Grade Distribution**

Variables		No. of patients	Percentage
<b>Age</b>	20-35	06	6.97
	36-50	30	34.88
	51-65	32	37.20
	>66	18	20.93
<b>Gender</b>	Male	58	67.44
	Female	28	32.55
<b>Grade</b>	1	08	9.30
	2	63	73.25
	3	12	13.95
	4	03	3.48

Patients are broken down into groups according to age, gender, and grade in the table. The age range of 51 to 65 years old makes up the largest group in terms of age distribution, accounting for 37.20% of all patients. Ages 36 to 50 make up the next largest group, accounting for 34.88% of the total. Individuals over 66 years of age make up 20.93% of the patient population, with individuals between the

ages of 20 to 35 making up 6.97% of the patient population. The gender distribution of the patient population reveals a preponderance of males at 67.44%, with 32.55% being female. 73.25% of patients, or the majority, are in Grade 2, according to the grade distribution. 9.30% of patients are in Grade 1, 13.95% are in Grade 3, and 3.48% of patients are in Grade 4, which is the lowest group.

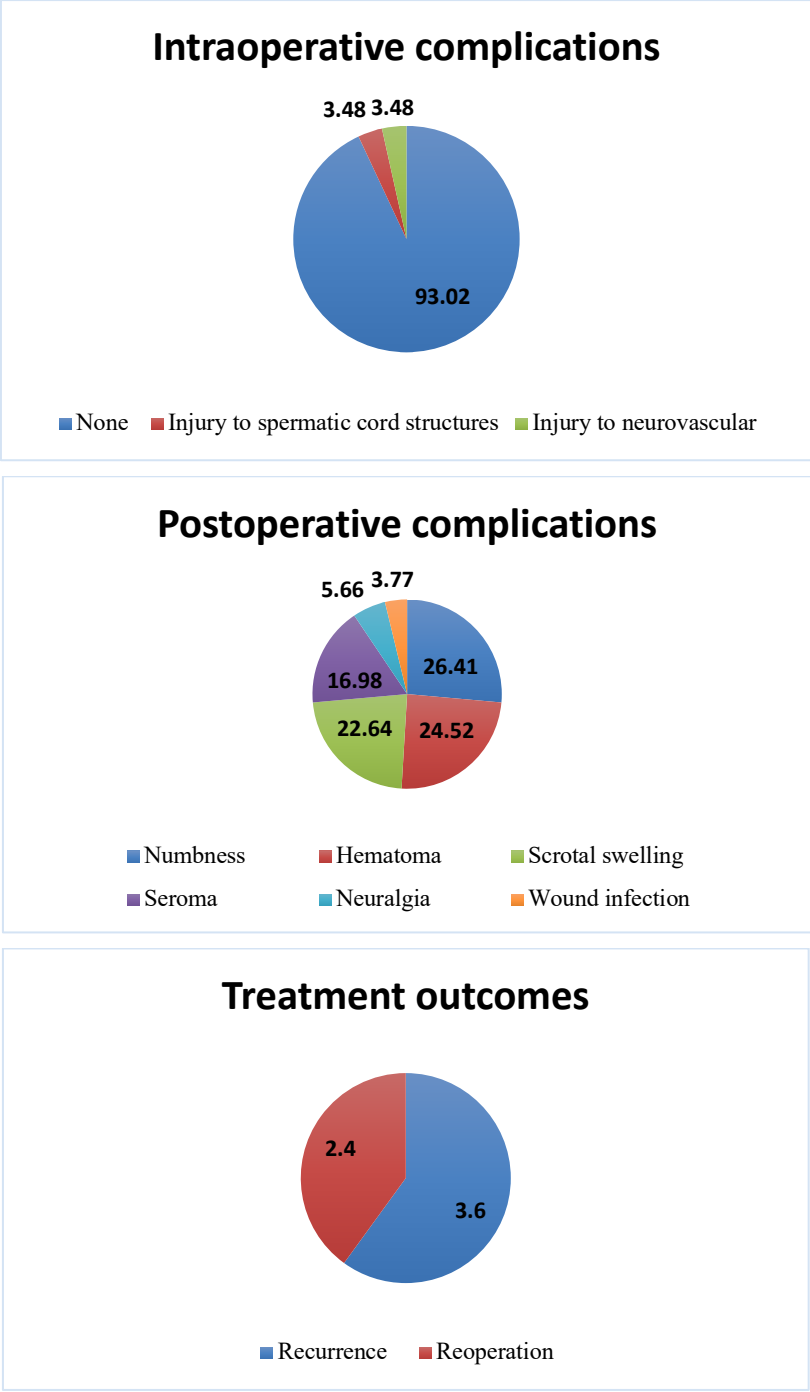


**Table:1.2 Complications and Treatment Outcomes**

	Complication	N	%
<b>Intraoperative complications</b>	<b>None</b>	80	93.02
	<b>Injury to spermatic cord structures</b>	3	3.48
	<b>Injury to neurovascular</b>	3	3.48
<b>Postoperative complications</b>	<b>Numbness</b>	14	26.41
	<b>Hematoma</b>	13	24.52
	<b>Scrotal swelling</b>	12	22.64
	<b>Seroma</b>	09	16.98
	<b>Neuralgia</b>	3	5.66
	<b>Wound infection</b>	2	3.77
<b>Treatment outcomes</b>	<b>Recurrence</b>	3	3.6
	<b>Reoperation</b>	2	2.4

The table lists treatment outcomes and the likelihood of problems after a medical procedure. 93.02% of the patients had no problems during the perioperative phase. On the other hand, 3.48% of patients had damage to structures related to the spermatic cord, and the same proportion had damage to structures related to the nervous system. Numbness was described by 26.41% of patients as

the most frequent postoperative consequence, followed by hematoma (24.52%), scrotal enlargement (22.64%), and seroma (16.98%). 5.66% of patients had neuralgia, while 3.77% had wound infection. In terms of the results of the treatment, 3.6% of patients experienced a return of the illness, and 2.4% needed a reoperation.



**Discussion**

With limited resources, this study aims to evaluate the "Outcomes and Complications of Open Mesh Inguinal Hernia Repair in a rural tertiary care hospital in Bihar" and offers important insights into the real-world use of this surgical procedure.[15] The majority of patients in the sample were older adults, with 20.93% over 66 years old and 37.20% between 51 and 65 years old, indicating the procedure's applicability to an age group commonly impacted by hernias.[16] The incidence was significantly higher in men (67.44%) than in women (32.55%), which is in line with established

epidemiological patterns. The majority of hernias (73.25%) were categorized as Grade 2, indicating that moderate instances are frequently treated.[17]

The majority of patients had good intraoperative results, with 93.02% reporting no problems. Injuries to the spermatic cord and neurovascular structures (3.48% each) were among the few intraoperative problems that did arise, although they were appropriately handled. Postoperative consequences were more common but still within acceptable ranges: numbness (26.41%), hematoma (24.52%), and scrotal edema (22.64%). Despite their

importance, these problems did not materially impair the overall results. Further evidence that infection control procedures are sufficient is provided by the low frequency of wound infections (3.77%).[18]

The remarkably low recurrence rate of 3.6% and reoperation rate of 2.4% highlight how successful the open mesh approach is in avoiding hernia recurrence and reducing the need for follow-up procedures.[19] These results show that the open mesh repair method works well even with the limitations of a rural tertiary care hospital setting. In incomparable healthcare settings, addressing the noted issues through better surgical methods and improved postoperative care could further maximize outcomes and patient satisfaction.

### Conclusion

In conclusion, a complicated interaction between systemic issues and surgical efficacy is reflected in the results and consequences of open mesh inguinal hernia repair in a rural tertiary care hospital in Bihar. Mesh repair has many advantages, including better patient outcomes and a decreased risk of recurrence; however, some drawbacks need to be carefully considered. To ensure that the advantages of this treatment are maximized while addressing the potential hazards and limits inherent in such settings, it is imperative to comprehend these outcomes and obstacles to improve surgical practices and patient care in rural tertiary care hospital.

### References

1. Bringman S, Wollert S, Osterberg J, Heikkinen T. Early results of a randomized multicenter trial comparing Prolene and VyproII mesh in bilateral endoscopic extraperitoneal hernioplast (TEP). *Surgical Endoscopy and Other Interventional Techniques*. 2005 Apr; 19:536-40.
2. Agrawal A, Avill R. Mesh migration following repair of inguinal hernia: a case report and review of literature. *Hernia*. 2006 Mar; 10:79-82.
3. Champault G, Bernard C, Rizk N, Polliand C. Inguinal hernia repair: the choice of prosthesis outweighs that of technique. *Hernia*. 2007 Apr; 11:125-8.
4. Paajanen H. A single-surgeon randomized trial comparing three composite meshes on chronic pain after Lichtenstein hernia repair in local anesthesia. *Hernia*. 2007;11(4):335-9.
5. Amid PK. Lichtenstein tension-free hernioplasty: its inception evolution, and principles. *Hernia*.2004;8(1):1-7
6. Kingsnorth A, Gingell-Littlejohn M, Nienhuijs S, Schüle S, Appel P, Ziprin P, et al. Randomized controlled multicenter international clinical trial of self-gripping Parietex™ progrip™ polyester mesh versus light-weight polypropylene mesh in open inguinal hernia repair: interim results at 3 months. *Hernia*. 2012;16(3):287-94
7. Khalil RA, alawadaa. Incidence of complications following open mesh repair for inguinal hernia. *Int J Med*. 2014;2(2):60-2
8. Cheongkx, lohy, neojxa, appasamyv, chiumt. Inguinal hernia repair: are the results from a general hospital comparable to those from dedicated hernia centers? *Singapore Med J*. 2014;2(2):191.
9. MRC Laparoscopic Groin Hernia Trial Group. Laparoscopic versus open repair of groin hernia: a randomised comparison. *The Lancet*. 1999 Jul 17;354(9174):185-90.
10. McCormack K, Scott NW, Go PM, et al. Laparoscopic techniques versus open techniques for inguinal hernia repair. *Cochrane Database Syst Rev* 2003;(1): CD001785.
11. Aasvang E, Kehlet H. Surgical management of chronic pain after inguinal hernia repair. *Br J Surg*.2005; 92:795-801
12. Bay-Nielsen M, Kehlet H, Strand L, malmströmj, andersenfh, warap,et al. Quality assessment of 26,304 herniorrhaphies in Denmark: a prospective nationwide study. *Lancet*.2001;358:1124-8.
13. Flum DR, Horvath K, Koepsell T. Have outcomes of incisional hernia repair improved with time? A population-based analysis. *Ann Surg* 2003; 237:129-35.
14. Li J, Ji Z, Li Y. The comparison of self-gripping mesh and sutured mesh in open inguinal hernia repair: the results of a meta-analysis. *Ann Surg*. 2014;259(6):1080-5.
15. French Associations for Surgical Research, Oberlin P, Boudet MJ, et al. Recurrence after inguinal hernia repair: prognostic facts in a prospective study of 1706 hernias. *Br J Surg* 1995;82: Suppl 1:65. abstract.
16. Friis E, Lindahl F. The tension-free hernioplasty in a randomized trial. *Am J Surg* 1996; 172:315-19.
17. Cunningham J, Temple WJ, Mitchell P, Nixon JA, Preshaw RM, Hagen NA. Cooperative hernia study: pain in the postrepair patient. *Ann Surg* 1996; 224:598-602.
18. Kumar S, Wilson RG, Nixon SJ, Macintyre IM. Chronic pain after laparoscopic and open mesh repair of groin hernia. *Br J Surg* 2002; 89:1476-9.
19. Condon RE, Nyhus LM. Complications of groin hernia. In: Nyhus LM, Condon RE, eds. *Hernia*. 4th ed. Philadelphia: J.B. Lippincott, 1995:269-82.