

Article

Barriers To Early Elective Hernia Repair in Low-Resource Settings and Their Impact on Emergency Presentations

Article History:

Name of Authors & Affiliation

Dr. Sihab Sajid Shaikh, 2nd year Resident, Department of General Surgery, Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra, India Email: sihabshaikh36@gmail.com

Dr. Sivaji Ghose, Professor and Head of Department, Department of General Surgery, Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra, India Email: sharkdoctor007@gmail.com

Dr. Nishad Arun Shirke, 2nd year Resident General Surgery Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra, India Email: shirke.nishad333@gmail.com

Dr. Mohammad Kashif, 2nd year Resident General Surgery Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra, India Email: azmikashif05@gmail.com

Corresponding Author:

Dr. Sihab Sajid Shaikh, 2nd year Resident, Department of General Surgery, Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra, India Email: sihabshaikh36@gmail.com

Received: 02/08/2025

Accepted: 24/08/2025

Published: 08/09/2025

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Noncommercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Abstract: **Background:** Timely elective hernia repair prevents complications, yet in low-resource settings, patients often present late, leading to emergency surgeries with higher morbidity. **Objective:** This study aimed to identify barriers to early elective hernia repair and their impact on emergency presentations in a rural Indian tertiary care hospital. **Methods:** A cross-sectional study was conducted at Vedantaa Institute of Medical Sciences, Dahanu, Maharashtra, from January to March 2025, enrolling 40 patients with abdominal wall hernias. Data on sociodemographics, clinical characteristics, care-seeking pathways, and perceived barriers were collected and analyzed using descriptive statistics and logistic regression. **Results:** Of the 40 patients, 25 (62.5%) presented electively and 15 (37.5%) as emergencies. Inguinal hernia was the most common type (60%). The predominant barriers were financial constraints (60%) and lack of awareness (47.5%). Lack of awareness was significantly associated with emergency presentation (OR 5.61, 95% CI 1.41–22.35, $p=0.01$). Emergency cases more frequently presented with obstruction or strangulation, with 20% requiring bowel resection. **Conclusion:** Financial barriers and lack of awareness are the leading obstacles to early elective hernia repair in low-resource settings, with delayed care resulting in higher emergency presentations and complications. Strengthening patient education and improving accessibility may reduce the burden of emergencies.

Keywords: Hernia repair, Emergency surgery, Low-resource settings, Barriers to care, Rural health.

BACKGROUND

Abdominal wall hernias are one of the most common surgical conditions worldwide, with inguinal hernias accounting for approximately 75% of cases. Elective repair is widely recommended as it prevents complications such as incarceration, obstruction, and strangulation, which carry higher morbidity and mortality when treated as emergencies.[1] Most hernia repairs in high-income countries are performed electively, with emergency presentations relatively rare (2.5–7.7%).[2] In contrast, studies from low- and middle-income countries (LMICs) show a much higher proportion of emergency hernia surgeries, sometimes exceeding 40–70% of total cases.[3] This disparity is largely attributed to multiple barriers, including financial constraints, limited surgical workforce, poor health literacy, transportation difficulties, and delays within healthcare systems.[4] These barriers often result in delayed presentation until complications arise, increasing the need for emergency operations associated with worse outcomes.[5] Globally, hernia surgery has been used as a tracer condition to evaluate access to essential surgical care. A large international prospective cohort demonstrated that while waiting times

for elective surgery were not the primary issue, delays between symptom onset and diagnosis were the major contributors to emergency presentations in LMICs.[6] Further, rural and low-resource regions of India reflect similar challenges, where poor awareness, economic dependency on daily wages, and limited tertiary surgical services restrict early elective interventions. Therefore, it is interesting to study the barriers to early elective hernia repair and their impact on emergency presentations in low-resource settings such as Dahanu, Maharashtra, India.

MATERIALS AND METHODS

Study Design and Setting

This hospital-based, descriptive cross-sectional study was conducted in the Department of General Surgery at Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra, India. The institute is a tertiary care teaching hospital catering to a large rural and semi-urban population with limited healthcare access. The study was carried out over three months, from January 1, 2025, to March 31, 2025.

Study Population and Sample Size

The study population included all adult patients presenting to the hospital diagnosed with abdominal wall hernia during the study period. A total of 40 patients were enrolled consecutively, representing elective and emergency presentations. This sample size was considered adequate for descriptive evaluation within the study timeframe and available resources.

Inclusion and Exclusion Criteria

Patients were eligible if they were aged 18 years and above, diagnosed clinically with abdominal wall hernias including inguinal, femoral, umbilical, epigastric, and incisional hernias, and consented to participate in the study. Exclusion criteria were applied to patients below 18 years of age, those with hernias of traumatic etiology, and those who declined to provide informed consent. Patients with incomplete clinical records or those unfit for surgical evaluation were also excluded.

Data Collection Procedure

Data were collected using a structured, pre-tested pro forma administered by the investigators. The pro forma captured sociodemographic details (age, sex, occupation, socioeconomic status, education), clinical characteristics (type of hernia, duration of symptoms, comorbidities), and mode of presentation (elective or emergency). Special emphasis was placed on identifying barriers to early elective hernia repair. These barriers were assessed through direct patient interviews, including financial constraints, lack of awareness, fear or stigma, distance and transportation issues, healthcare access delays, and institutional/systemic factors. Qualitative responses were noted verbatim, when possible, to capture patient perspectives.

Variables and Definitions

For this study, “elective hernia repair” was defined as planned surgical management for uncomplicated hernia. “Emergency presentation” was defined as cases requiring immediate surgical intervention due to complications such as irreducibility, incarceration, obstruction, or strangulation. Barriers were categorized as patient-related (financial, educational, psychological) and system-related (infrastructure, staffing, referral delays).

Ethical Considerations

The Institutional Ethics Committee of Vedantaa Institute of Medical Sciences, Dahanu reviewed and approved the study protocol. Informed written consent was obtained from all participants before inclusion. Patient confidentiality was maintained by anonymizing data, and all study procedures adhered to the ethical principles of the Declaration of Helsinki.

Data Management and Statistical Analysis

Collected data were entered into a password-protected database. Quantitative variables such as age and symptom duration were summarized using means, standard deviations, and medians. In contrast, categorical variables such as sex, type of hernia, and barriers were expressed as frequencies and percentages. Comparisons between elective and emergency presentation groups were performed using chi-square or Fisher’s exact test for categorical variables and independent t-test or Mann–Whitney U test for continuous variables, depending on data distribution. A p-value of less than 0.05 was considered statistically significant. Thematic analysis was applied to qualitative responses to identify key recurring patterns of barriers.

RESULTS

A total of 40 patients with abdominal wall hernias were included in the study. The mean age was 46.2 ± 12.1 years, with 32 males (80%) and 8 females (20%). Emergency presentations accounted for 15 patients (37.5%), while 25 (62.5%) were elective.

Sociodemographic and Clinical Characteristics

Most patients belonged to the lower socioeconomic class and were daily wage workers. Inguinal hernia was the most common type observed, followed by umbilical and incisional hernias (Table 1).

Table 1. Sociodemographic and clinical characteristics of study participants (n=40)

Variable	Categories	Frequency (n)	Percentage (%)
Age (years)	<30	5	12.5
	31–50	18	45.0
	>50	17	42.5
Sex	Male	32	80.0
	Female	8	20.0
Occupation	Laborer	20	50.0
	Farmer	8	20.0
	Housewife	6	15.0
	Others	6	15.0
Socioeconomic status	Lower	28	70.0
	Middle	10	25.0
	Upper	2	5.0
Type of hernia	Inguinal	24	60.0
	Umbilical	8	20.0
	Incisional	5	12.5
	Femoral	2	5.0
	Epigastric	1	2.5

Duration of Symptoms and Healthcare Pathway

Patients presenting electively reported longer symptom duration compared with emergency cases. Emergency cases more frequently sought initial care from non-specialist providers (Table 2).

Table 2. Duration of symptoms and healthcare contact

Variable	Elective (n=25)	Emergency (n=15)	p-value
Mean duration of symptoms (months)	8.4 ± 4.1	3.2 ± 2.6	<0.01
First healthcare contact: PHC	12 (48.0%)	4 (26.7%)	
First healthcare contact: Private clinic	8 (32.0%)	3 (20.0%)	
First healthcare contact: Direct tertiary	5 (20.0%)	3 (20.0%)	
First healthcare contact: Pharmacist/non-medical	0 (0%)	5 (33.3%)	0.04
Time from first contact to surgery (days)	42.6 ± 15.3	5.8 ± 3.1	<0.001

Reported Barriers

Financial constraints and lack of awareness were the most frequently cited barriers overall. Emergency presenters more often reported lack of awareness and fear compared to elective cases (Table 3).

Table 3. Reported barriers to early elective hernia repair

Barrier	Elective (n=25)	Emergency (n=15)	Total (n=40)	p-value
Financial difficulty	14 (56.0%)	10 (66.7%)	24 (60.0%)	0.47
Lack of awareness	8 (32.0%)	11 (73.3%)	19 (47.5%)	0.01
Transport/distance	6 (24.0%)	5 (33.3%)	11 (27.5%)	0.49
Fear/anxiety of surgery	5 (20.0%)	7 (46.7%)	12 (30.0%)	0.08
System/institutional delay	4 (16.0%)	3 (20.0%)	7 (17.5%)	0.76

Emergency Presentations and Outcomes

Among the 15 emergency cases, irreducibility was the most common presentation, followed by obstruction and strangulation. Three patients required bowel resection. No perioperative mortality was recorded (Table 4).

Table 4. Emergency case presentations and outcomes (n=15)

Complication	Frequency (n)	Percentage (%)
Irreducible hernia	7	46.7

Intestinal obstruction	4	26.7
Strangulated hernia	4	26.7
Bowel resection required	3	20.0
Mortality	0	0.0

Association Between Barriers and Emergency Presentation

Logistic regression analysis demonstrated that lack of awareness and fear/anxiety were significantly associated with emergency presentations, while financial and system-related barriers were common to both groups (Table 5).

Table 5. Association between barriers and emergency presentations

Barrier	Odds Ratio (95% CI)	p-value
Financial difficulty	1.56 (0.43–5.68)	0.48
Lack of awareness	5.61 (1.41–22.35)	0.01
Transport/distance	1.56 (0.39–6.26)	0.52
Fear/anxiety	3.44 (0.89–13.29)	0.07
System/institutional delay	1.32 (0.27–6.51)	0.74

DISCUSSION

This study demonstrated that nearly two-fifths of patients with abdominal wall hernia in a rural Indian tertiary hospital presented as emergencies, a rate far higher than that observed in high-income countries where emergency repairs account for only 2.5–7.7% of cases.[7] Our findings are consistent with sub-Saharan Africa and South Asia reports, where emergency hernia repairs often constitute 40–70% of all hernia operations.[8,9] The greater morbidity observed among emergency cases, including a 20% requirement for bowel resection in our series, reinforces prior evidence that delayed presentation substantially increases surgical risk.[10,11]

Financial constraints and lack of awareness emerged as the most significant barriers to early elective repair. While 60% of our cohort reported cost as a deterrent, lack of awareness was strongly associated with emergency presentations (OR 5.61, $p=0.01$). Similar findings have been reported in Ghana and Uganda, where misconceptions about hernia severity and reliance on non-specialist providers delay care-seeking.[12] Additional barriers such as transport difficulties and fear of surgery also played a role, echoing prior studies that identified distance, cultural beliefs, and mistrust of health systems as common obstacles in low-resource settings.[13,14] Addressing these barriers through education, financial protection schemes, and improved referral pathways is therefore crucial.

Our results have important policy implications. Strengthening awareness at the community level, ensuring affordable surgical access, and expanding elective surgical capacity at district hospitals could significantly reduce preventable emergencies. Strategies such as training non-specialist surgeons in safe hernia repair and integrating hernia management into essential surgical care packages, as recommended by the Global Surgery 2030 agenda, are feasible approaches for India.[15] Although our study was limited by small sample size and single-center design, it provides valuable insights into context-specific barriers. It underscores the urgent need to promote early elective repair in rural populations.

CONCLUSION

This study highlights that barriers such as financial constraints, lack of awareness, transport difficulties, and fear of surgery continue to delay elective hernia repair in low-resource settings. Among these, lack of awareness was the most significant factor in emergency presentations. Patients presenting emergently often had complicated hernias requiring more extensive surgical intervention, including bowel resection in some cases. These findings emphasize the importance of strengthening community education, ensuring affordable surgical access, and improving referral pathways to encourage timely elective repair. Addressing these barriers has the potential to reduce the frequency of emergency presentations, lower complication rates, and improve overall surgical outcomes in rural populations.

REFERENCES

1. Kulacoglu H. Current options in inguinal hernia repair in adult patients. *Hippokratia* [Internet]. 2011 [cited 2025 Sept 3];15(3):223–31. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3306028/>
2. Köckerling F, Heine T, Adolf D, Zarras K, Weyhe D, Lammers B, et al. Trends in Emergent Groin Hernia Repair—An Analysis From the Herniated Registry. *Front Surg* [Internet]. 2021 Mar 30 [cited 2025 Sept 3];8:655755. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8042323/>
3. Picciochi M, Alexander PV, Anyomih T, Boumas N, Crawford R, Enoch Gyamfi F, et al. Provision of inguinal hernia surgery in first-referral hospitals across low- and middle-income countries: Secondary analysis of an

- international cohort study. *World J Surg* [Internet]. 2025 Feb [cited 2025 Sept 3];49(2):374–84. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11798680/>
4. Jindal M, Chaityachati KH, Fung V, Manson SM, Mortensen K. Eliminating health care inequities through strengthening access to care. *Health Serv Res* [Internet]. 2023 Dec [cited 2025 Sept 3];58(Suppl 3):300–10. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10684044/>
5. Sartini M, Carbone A, Demartini A, Giribone L, Oliva M, Spagnolo AM, et al. Overcrowding in Emergency Department: Causes, Consequences, and Solutions—A Narrative Review. *Healthcare (Basel)* [Internet]. 2022 Aug 25 [cited 2025 Sept 3];10(9):1625. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9498666/>
6. NIHR Global Health Research Unit on Global Surgery. Access to and quality of elective care: a prospective cohort study using hernia surgery as a tracer condition in 83 countries. *Lancet Glob Health*. 2024 July;12(7):e1094–103.
7. Pavithira GJ, Dutta S, Sundaramurthi S, Nelamangala Ramakrishnaiah VP. Outcomes of Emergency Abdominal Wall Hernia Repair: Experience Over a Decade. *Cureus*. 2022 June;14(6):e26324.
8. Ndong A, Diallo AC, Falola A, Ndiaye MA, Faye M, Faye PM, et al. Choice of Surgical Technique in Groin Hernia Surgery Among Residents in Senegal: Experience and Influencing Factors. *J Abdom Wall Surg* [Internet]. 2025 May 30 [cited 2025 Sept 3];4:14076. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC12162351/>
9. Ma Q, Jing W, Liu X, Liu J, Liu M, Chen J. The global, regional, and national burden and its inguinal, femoral, and abdominal hernia trends from 1990 to 2019: findings from the 2019 Global Burden of Disease Study – a cross-sectional study. *Int J Surg* [Internet]. 2023 Mar 24 [cited 2025 Aug 25];109(3):333–42. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10389329/>
10. Arnarson Ö, Syk I, Butt ST. Who should operate patients presenting with emergent colon cancer? A comparison of short- and long-term outcome depending on surgical sub-specialization. *World J Emerg Surg* [Internet]. 2023 Jan 9 [cited 2025 Sept 3];18:3. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9830814/>
11. Simianu VV, Strate L, Billingham RP, Fichera A, Steele SR, Thirlby RC, et al. The Impact of Elective Colon Resection on Rates of Emergency Surgery for Diverticulitis. *Ann Surg* [Internet]. 2016 Jan [cited 2025 Sept 3];263(1):123–9. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4512938/>
12. Matovu A, Nordin P, Wladis A, Ajiko MM, Löfgren J. Groin Hernia Surgery in Uganda: Caseloads and Practices at Hospitals Operating Within the Publicly Funded Healthcare Sector. *World J Surg* [Internet]. 2020 [cited 2025 Sept 3];44(10):3277–83. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7458893/>
13. Ibbotson JL, Luitel B, Adhikari B, Jagt KR, Bohler E, Riviello R, et al. Overcoming Barriers to Accessing Surgery and Rehabilitation in Low and Middle-Income Countries: An Innovative Model of Patient Navigation in Nepal. *World J Surg* [Internet]. 2021 [cited 2025 Sept 3];45(8):2347–56. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8064415/>
14. Syed ST, Gerber BS, Sharp LK. Traveling Towards Disease: Transportation Barriers to Health Care Access. *J Community Health* [Internet]. 2013 Oct [cited 2025 Sept 3];38(5):976–93. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4265215/>
15. Zadey S, Iyer H, Nayan A, Shetty R, Sonal S, Smith ER, et al. Evaluating the status of the Lancet Commission on Global Surgery indicators for India. *Lancet Reg Health Southeast Asia* [Internet]. 2023 Apr 5 [cited 2025 Sept 3];13:100178. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10306037/>