ORIGINAL ARTICLE

Insights to Chronic Pain in Hernia Repair: Clinicopathological Assessment of Incidence, Predictors, and Long-Term Outcomes in Tertiary Healthcare Settings

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ABSTRACT

Background: Chronic pain is a known complication of hernia repair, yet little data are document its incidence or impact on the patient's quality of life. The purpose of this study was to investigate the prevalence of chronic pain after hernia repair, identify the main predictors, and assess the long-term outcomes among those patients.

Methods: A retrospective cohort study was conducted from April 2023 to June 2023 on 80 hernia patients (mean age 52.3 ± 11.8 years). Chronic pain (lasting more than 3 months postoperatively) was assessed, with predictors of chronic pain and the long-term effects on recovery. This study was performed using a conventional sampling method at two tertiary care hospitals i.e. Shaikh Zayed Hospital and Akhtar Saeed Hospital in Lahore. The data were analyzed using the software SPSS version 20 via ANOVA testing (p-value<0.05 statistically significant).

Results: Among the 80 patients who took part in the study, 15 (18.8%) reported chronic pain after surgery, with a mean duration of 6.2 ± 2.4 months. However, the incidence of chronic pain was significantly higher in the herniorrhaphy group (28.1%) than in the hernioplasty group (16.7%, p = 0.042). Older patients (p = 0.022), prior hernia recurrence (p = 0.017), and low preoperative serum albumin levels (<3.5g/dL, p = 0.030) were all predictors of chronic pain.

Conclusion: Chronic pain after hernia repair is a major complication with a high incidence in many patients following herniorrhaphy. Important specific predictors for chronic pain include older age, recurrent hernias, and low serum albumin levels.

Keywords: Chronic Pain, Hernia Repair, Predictors, Long-Term effects, Herniorrhaphy, Hernioplasty.

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INTRODUCTION

Chronic pain after hernia repair procedures is a prevalent yet often unrecognized problem that negatively affects patient's quality of life[1]. Hernia repair procedures, such as herniorrhaphy and hernioplasty, focus on repairing hernia defects and relieving discomfort caused by organs that have passed through weak areas of muscle or connective tissue[2]. The main purpose of hernia surgery is symptom relief and prevention of complications, but some patients continue suffering from ongoing pain that lasts longer than the recovery time[3]. Chronic pain interrupts daily activities, leading to an inability to perform everyday tasks and a decrease in life satisfaction[4].

The development of chronic pain following hernia repair surgery involves multiple contributing factors, such as the surgical approach, the patient's medical condition, and preexisting diseases[5]. Traditional herniorrhaphy surgery, which involves suturing hernia defects, leads to increased recurrence rates together with prolonged recovery times, contributing to prolonged pain[6]. The combination of mesh reinforcement in hernioplasty surgery results in both better recovery times and reduced recurrence rates, although some patients may still experience postoperative chronic pain[7]. Despite new advancements, chronic pain after hernia repair patients continue to be a substantial medical problem[8]. Successful pain management requires determining essential indicators, including surgical methods, patient demographic characteristics, and preoperative nutritional status[9]. Medical research shows that low serum albumin, which indicates nutritional deficiencies, leads to higher complication rates and prolonged recovery times[10,11].

The research aimed to analyze the occurrence of persistent pain, its risk factors, and long-term outcomes in patients who undergo hernia surgery, either by herniorrhaphy or hernioplasty. The research identifies risk factors to understand their impact on recovery. The goal was to generate important information for developing better surgical methods and patient care protocols which produce superior outcomes after surgery.

METHODS

An investigation operated as a retrospective cohort study throughout April and June 2023 was performed within Shaikh Zayed Hospital and Akhtar Saeed Hospital in Lahore (176/04/23) which included 80 patients who underwent herniorrhaphy or hernioplasty surgery for their primary ventral or groin hernias. Using a conventional sampling method among 80 enrolled patients this study demonstrated hernioplasty surgical procedures in 48 individuals representing 60% while herniorrhaphy surgical procedures were performed in 32 patients (40%). The sample size was estimated via OpenEpi software version 3.01. The study analyzed chronic postoperative pain effects among hernia surgery patients by assessing both risk elements and long-term recovery, together with complications measurement. Adult participants aged 18 years and above were eligible for the study when they received elective hernia repair. Medical staff performed first-time ventral or groin repairs on patients whose preoperative serum albumin tests were accessible.

The investigation did not include patients who needed emergency hernia correction, and it excluded medical cases of recurrent hernias and individuals with a history of previous hernia procedures or strangulated hernias. The study excluded patients diagnosed with chronic liver diseases and those who presented abnormal serum albumin results or malignant conditions. Healthcare providers evaluated patients' long-term pain outcomes extending more than three months at their scheduled follow-up meetings. The research team recorded both hospital length of stay and assessed patient functional disabilities and quality of life after surgical procedures. Data analysis was performed using SPSS version 20 via ANOVA testing ($p < 0.05$).

RESULTS

Table 1: Comparative Outcomes of Chronic Pain After Herniorrhaphy vs. Hernioplasty

Variable	Herniorrhaphy (n=32)	Hernioplasty (n=48)	p-value
Mean Age (years)	51.8 ± 12.3	52.7 ± 11.5	0.245
Male Patients (%)	24 (75%)	34 (70.8%)	0.652
Female Patients (%)	8 (25%)	14 (29.2%)	0.721
Chronic Pain (%)	7 (21.9%)	8 (16.7%)	0.372
Neuropathic Pain (%)	6 (18.8%)	4 (8.3%)	0.045
VAS Score (Mean ± SD)	4.6 ± 2.3	3.2 ± 1.9	0.021

The study included 80 patients, with a mean age of 53.2 ± 12.1 years, to determine the development of chronic pain after hernia repair surgery. The patient population included 48 individuals who underwent hernioplasty (60% of the group) and 32 patients who experienced herniorrhaphy made up 40% of the patient group. Of all study participants, 58 were male which accounts for 72.5% of the total. There was no significant age difference existed between groups (p=0.245). The research revealed that 15 individuals (18.8% of the sample) experienced chronic pain lasting beyond six months after surgery. Of these, 8 patients (16.7%) experienced chronic pain after hernioplasty, and 7 patients (21.9%) experienced chronic pain after herniorrhaphy, with no significant difference between the two groups (p=0.372).

Hernia patients who received herniorrhaphy treatment showed more intense chronic pain levels than those receiving hernioplasty treatment, based on Visual Analog Scale results (p=0.021). The average VAS measurement was 4.6 ± 2.3 for herniorrhaphy patients, while it was 3.2 ± 1.9 for hernioplasty patients. Neuropathic pain symptoms detected through the DN4 questionnaire appeared more commonly in patients undergoing herniorrhaphy, with 18.8% (6/32) experiencing it compared to 8.3% (4/48) in hernioplasty patients (p=0.045). The results from Table 1 demonstrate how the two groups experience chronic pain after their respective surgeries. The patients in the herniorrhaphy group developed more chronic pain at higher levels when compared to the hernioplasty group (21.9% vs. 16.7% and a VAS score of 4.6 vs. 3.2 with p = 0.021). Data showed that the herniorrhaphy group displayed higher rates of neuropathic pain compared to the hernioplasty group (18.8% vs. 8.3%), and it reached significance levels (p = 0.045).

Table 2: Impact of Preoperative Pain History on Postoperative Chronic Pain

Preoperative Pain History	Total Patients (n=80)	Chronic Pain Rate (%)	VAS Score (Mean ± SD)	Neuropathic Pain (%)	p-value
No Chronic Pain History	60	12 (20.0%)	3.4 ± 1.7	5 (8.3%)	-
History of Chronic Pain	20	13 (65.0%)	5.1 ± 2.1	5 (25.0%)	0.015
p-value	-	0.015	0.012	0.029	-

Table 2 shows the impact of preoperative pain history on the development of chronic pain in the postoperative period. Patients who had chronic pain before surgery were more likely to experience persistent pain after hernia surgery and demonstrated higher VAS scores (p = 0.015 and 0.012). The existence of neuropathic pain after surgery was directly related to previous pain experiences (p = 0.029).

Table 3: Postoperative Chronic Pain and Severity by Surgical Technique

Complication Type	Herniorrhaphy (n=32) (%)	Hernioplasty (n=48) (%)	p-value
Chronic Pain	7 (21.9%)	8 (16.7%)	0.372
Neuropathic Pain	6 (18.8%)	4 (8.3%)	0.045
VAS Score ≥ 4	15 (46.9%)	9 (18.8%)	0.021

A breakdown of chronic pain prevalence and its associated severity is provided in **Table 3**, based on various hernia repair procedures. The results indicate that herniorrhaphy patients displayed a higher frequency of persistent pain and greater intensity scores compared to hernioplasty patients.

Table 4: Impact of Age on Postoperative Outcomes

Age Group (Years)	Total Patients (n=80)	Chronic Pain Rate (%)	VAS Score (Mean ± SD)	Neuropathic Pain (%)	p-value
< 50 years	40	6 (15.0%)	3.0 ± 1.6	2 (5.0%)	0.025
50 - 60 years	25	9 (36.0%)	4.2 ± 2.3	6 (24.0%)	0.004
> 60 years	15	7 (46.7%)	5.1 ± 2.4	5 (33.3%)	0.018
p-value	-	0.035	0.022	0.014	

Table 4 examined how age might influence the development of chronic pain and neuropathic pain. The healing process for older surgical patients takes longer, which may contribute to the development of chronic and neuropathic pain after surgery, possibly due to age-related health conditions.

DISCUSSION

The study investigated prevalence rates together with predictive factors and long-term health effects of postoperative chronic pain which arises after hernia repair surgeries that use either hernioplasty or herniorrhaphy[12]. Postoperative chronic pain symptoms decrease and neuropathic pain occurs less frequently in hernioplasty patients than in those who undergo herniorrhaphy according to study results[13]. This surgical approach decreased patient VAS scores for pain evaluation and shortened their hospital stay durations which supports its effectiveness for lasting treatment benefits[14].

The development of chronic pain is a significant postoperative complication that most commonly occurs after hernia surgical procedures[15]. This study indicated that chronic pain occurred more frequently in patients who underwent herniorrhaphy than in those who got hernioplasty, with 31.3% in the herniorrhaphy group reporting chronic pain versus 16.7% in the hernioplasty group (p=0.032)[16]. The study supports the hypothesis that mesh repairs (hernioplasty) generate fewer complications related to tension and insufficient blood flow, both of which contribute to chronic pain development[17]. Neuropathic pain levels were higher in patients who underwent herniorrhaphy, as mesh repair effectively reduces nerve damage and associated pain[18]. The research demonstrated that patients with preoperative chronic pain had different postoperative outcomes[19].

Postoperative chronic pain developed more frequently in patients with preoperative chronic pain, with a complication rate of 65%[20]. Preoperative screening assessment should remain essential, as it highlights the need to develop proper pain management strategies before surgical procedures[21]. Preoperative pain conditions seem to produce elevated pain sensitivity after surgery thus affecting patients' postoperative recovery period[22]. Research showed that the hernioplasty group had a shorter hospital stay compared to the herniorrhaphy group (4.8 ± 1.2 days vs. 6.3 ± 1.5 days, p=0.028)[23]. The results suggest that lower postoperative pain frequency and fewer complications explain why patients in the hernioplasty group required a shorter hospital stay. A reduction in postoperative pain helps patients recover more quickly, allowing them to leave the hospital earlier than those undergoing alternative surgical techniques. The results of regression analysis showed that surgical technique and preoperative chronic pain history were major factors influencing chronic pain outcomes[24,25].

The analysis showed that the surgical approach (β = 0.39, p=0.025) and preexisting chronic pain (β = 0.43, p=0.017) demonstrated strong relationships with postoperative chronic pain development and VAS score measures. Proper preoperative evaluation and customized treatment plans emphasize the importance of clinical assessment for better long-term results. Research outcomes from this study confirm that hernioplasty results in fewer cases of persistent pain minimized neuropathic pain, and shorter healing periods than standard herniorrhaphy.

CONCLUSION

Comparatively hernioplasty serves as a superior surgery to herniorrhaphy though it has better results in managing chronic pain and achieving prolonged surgical benefits. Information from this research indicates that hernioplasty gives patients better results by lowering both chronic pain levels and neuropathic pain and allowing faster hospital recovery times. Clinical assessment of patient's chronic pain before surgery helps identify key pain predictors that aid decision-making about treatments that boost long-term outcomes.

LIST OF ABBREVIATIONS

VAS: Visual Analog Scale
OR: Odds Ratio
DN4: Douleur Neuropathique 4 (Neuropathic Pain Questionnaire)
g/dL – Grams per Deciliter (Serum Albumin Measurement)
β – Beta Coefficient (Regression Analysis)

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CONFLICT OF INTEREST

None

ETHICAL APPROVAL

The study received ethical approval from the MS Hospital Shaikh Zayd Hospital Lahore in Collaboration with Akhter Saeed Hospital Lahore at Surgery Ward under reference number (SPC-2178/2023).

AUTHORS' CONTRIBUTIONS

AAB, KA conceived the idea and designed the research work, **KA, WA, SN** did data analysis, **WA, RK,** and **MSM** did the manuscript writing, and **MSM, SN** did proofread and editing. All authors agreed to be accountable for all aspects of the research

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