

Prophylactic ilioinguinal neurectomy in open inguinal hernia surgery

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Abstract

Introduction: Chronic Postoperative Inguinal Pain (CPIP) represents one of the most debilitating complications following inguinal hernia repair, with a reported incidence in the literature ranging from 10% to 30%. While the introduction of prosthetic meshes has significantly reduced recurrence rates, neuropathic pain due to nerve entrapment or postsurgical fibrosis remains a persistent clinical challenge. This analysis reports our institutional data on routine prophylactic ilioinguinal neurectomy for the prevention of CPIP.

Materials and methods: We conducted a retrospective analysis of 1,345 patients who underwent elective hernia repair using the Lichtenstein technique combined with prophylactic neurectomy between March 2007 and June 2025. Follow-up was performed 5–6 months postoperatively via telephone interview and, for symptomatic cases, through a targeted physical examination. The primary objective was to evaluate the presence or absence of CPIP.

Results: At the 5–6-month follow-up, 1,305 patients (97%) were completely asymptomatic. Although 40 patients (3%) reported discomfort during the telephone interview, subsequent clinical evaluation confirmed a 0% incidence of CPIP. The reported discomfort was classified as transient, non-specific, or unrelated to the surgical procedure.

Conclusions: Routine prophylactic neurectomy during Lichtenstein tension-free inguinal hernioplasty proved to be an effective and safe strategy to eliminate the risk of chronic neuropathic pain.

The procedure is well-tolerated, and any residual sensory deficit represents an acceptable clinical trade-off given the significant improvement in long-term quality of life.

Keywords: Inguinal hernia; Lichtenstein technique; Prophylactic neurectomy; Ilioinguinal nerve; Chronic postoperative inguinal pain (CPIP).

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Introduction

Elective inguinal hernia repair is currently one of the most frequently performed surgical procedures worldwide, with over 20 million operations conducted annually [1]. Although the introduction of prosthetic meshes has significantly contributed to reducing recurrence rates—which have dropped to approximately 2%, with associated complications at 3% [1]—the widespread prevalence of this condition exposes a vast number of patients to the risk of Chronic Postoperative Inguinal Pain (CPIP) [2].

The international guidelines of the HerniaSurge Group establish the improvement of patient outcomes as a primary objective, focusing specifically on the reduction of chronic pain, which is currently considered the most significant issue following hernia surgery [3]. CPIP is defined as pain of at least moderate intensity that impairs daily activities for a minimum of three months postoperatively [3,4].

The literature reports an extremely variable incidence of CPIP (ranging from 0.7% to 75%) due to the heterogeneity of measurement tools; however, the most recent systematic reviews estimate the rate between 10% and 30% [5]. A 2024 meta-analysis conducted on over 29,000 patients indicates a global incidence of 17.01%, with significant geographical variations: 18.65% in Europe, 14.70% in Asia, and 6.04% in North America [6]. Gram-Hanssen et al. highlighted that while pain of any grade affects 10–63% of patients, moderate-to-severe forms impact 1–18% of operated subjects [5].

Identifying predictors of chronicity is essential for effective risk stratification. Primary factors include female sex, characterized by a nearly doubled risk compared to men (OR 1.88), and young age, which is correlated with a higher susceptibility to developing CPIP (OR 2.26). Furthermore, preoperative pain plays a central role: a high preoperative pain score significantly increases the risk of persistent symptoms (OR 2.32). Finally, postoperative complications and acute pain management are of notable importance; indeed, high levels of pain in the early phase are considered a major risk factor for progression to chronicity [7].

CPIP is a debilitating condition with profound repercussions on quality of life and work capacity [8]. Regarding therapeutic options, the review by Beel et al. (2021) analyzed the surgical management of CPIP, highlighting the use of selective or triple neurectomies, often associated with the removal of the mesh and suture material, with success rates varying between 33% and 100% [9].

However, since the outcomes of curative treatments often remain uncertain, the prevention of CPIP remains the preferred strategy [8]. The purpose of this analysis is therefore to examine the primary predictors and preventive strategies to reduce the impact of this complication.

Among the various intraoperative mechanisms proposed as the etiology of chronic pain are perisciatric fibrosis of the ilioinguinal and iliohypogastric nerves resulting from mesh placement. Additionally, the accidental entrapment of nerves within the mesh anchoring sutures may further contribute to the pathogenesis of chronic pain.

Materials and methods

Beginning in 2001, we introduced routine ilioinguinal neurectomy into our clinical practice for all inguinal hernia repair procedures. The aim of the present study is to compare our institutional series with existing literature data regarding chronic inguinal pain following open surgery using the Lichtenstein technique. Currently, there is no unanimous consensus on the definition of chronic inguinal pain, both in terms of the postoperative time interval and the severity of symptoms. In our study, we chose to evaluate pain based exclusively on its presence or absence at 5–6 months postoperatively, rather than its intensity.

In our personal series of 1,998 inguinal hernias operated on between April 2001 and June 2025, 201 patients who underwent emergency surgery were excluded. Since 2007, we have systematically recorded the presence of inguinal pain at 5- or 6-months post-surgery; therefore, the total number of cases recruited for this study consists of 1,345 patients. An additional 97 patients were excluded as they did not attend the follow-up or could not be reached by telephone.

In cases where painful symptoms were reported during the telephone interview, the patient underwent a targeted surgical physical examination. Data regarding the specific type of hernia (indirect, direct, or mixed) were not available.

Results

The analyzed series includes a total of 1,345 patients who underwent inguinal hernia repair using the Lichtenstein technique with prophylactic ilioinguinal neurectomy between March 2007 and June 2025.

At the follow-up conducted 5–6 months postoperatively via telephone interview or outpatient clinical assessment, 1,305 patients (97%) were found to be asymptomatic. Painful symptoms or discomfort were reported over the phone by 40 patients (3%).

Among the patients who reported pain during the telephone interview, subsequent clinical evaluation via physical examination confirmed a 0% incidence of CPIP. In all such cases (3%), the reported discomfort was classified as transient or unrelated to the surgical procedure.

Discussion

Our findings across 1,345 patients demonstrate that the routine performance of prophylactic ilioinguinal neurectomy during open Lichtenstein repair resulted in a 0% incidence of CPIP, as confirmed by clinical examination. This evidence stands in stark contrast to international literature, which reports CPIP rates ranging between 10% and 30% [5,6].

In our study, the discrepancy between pain reported via telephone (3%) and that confirmed upon physical examination (0%) suggests that an exclusively anamnestic evaluation may overestimate the incidence of this pathology. Indeed, the subjective discomfort reported by patients did not meet the clinical criteria for CPIP, as it was often attributable to transient hypoesthesia or non-specific symptoms unrelated to the surgical procedure.

The etiology of CPIP is predominantly neuropathic. The entrapment of the ilioinguinal nerve within prosthetic anchoring sutures or its chronic irritation due to mesh-induced periscitric fibrosis are mechanisms extensively documented in the literature. Prophylactic neurectomy acts preventively by eliminating the anatomical substrate of such complications.

In a recent prospective study published in 2020, Uppada et al. [11] concluded that neurectomy significantly reduces the incidence of chronic pain compared to nerve preservation, without compromising the patients' quality of life due to sensory deficits. Similarly, the randomized trial by Mui et al. [10] reported a reduction in chronic pain from 28.6% to 8% through neurectomy. Although Picchio et al. [13] suggest caution regarding prophylactic neurectomy due to the risk of persistent paresthesia, our experience demonstrates that residual hypoesthesia is well-tolerated and represents an acceptable clinical trade-off to prevent a debilitating condition such as CPIP.

Finally, the meta-analysis by Smeds et al. [12] confirms that neurectomy does not increase overall postoperative morbidity. The standardization of the surgical technique and the extensive case series at our center suggest that a routine approach offers greater predictability of outcomes, eliminating the variability associated with intraoperative nerve manipulation or damage during dissection maneuvers.

Conclusions

Reducing the incidence of chronic postoperative pain remains a significant challenge in open inguinal hernia surgery, given its debilitating impact on the quality of life of operated patients. Despite the ongoing scientific debate regarding the necessity of preserving nerve integrity, the data obtained from our large-scale series appear promising in eliminating the risk of neuropathic damage.

In conclusion, we believe that prophylactic ilioinguinal neurectomy should be considered a safe and standard option in open hernia repair. It represents an effective preventive strategy to significantly improve long-term patient quality of life.

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