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# Comparative Analysis of Postoperative Pain Syndrome in Cardioesophageal Cancer

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**Annotation:** Postoperative pain syndrome (POPS) remains a significant clinical challenge in patients undergoing surgery for cardioesophageal cancer (CEC). Despite the implementation of multimodal analgesia protocols, adequate pain control is not consistently achieved. This study aimed to comparatively assess postoperative pain intensity depending on the type of surgical access and tumor characteristics in patients with CEC. Eighty-five patients who underwent open surgical treatment were evaluated using the Numeric Rating Scale (NRS). Pain intensity was analyzed in relation to surgical approach, tumor phenotype, disease stage, and demographic factors. The highest pain intensity was observed in patients who underwent thoracophrenicolaparotomy. Multimodal analgesia improved pain control; however, pain levels exceeded the adequate analgesia threshold (>4 points) in a substantial proportion of patients. The findings indicate that

postoperative pain intensity is primarily associated with the extent of surgical trauma rather than gender or age factors, highlighting the need for optimization of regional analgesia techniques in oncologic surgery.

**Keywords:** Cardioesophageal cancer, postoperative pain syndrome, multimodal analgesia, thoracophrenicolaparotomy, thoracotomy, Numeric Rating Scale, oncology surgery, analgesia effectiveness.

## Introduction

Cardioesophageal cancer (CEC) is characterized by heterogeneous clinical manifestations, most commonly including progressive dysphagia, anemia of multifactorial origin, and pain syndrome of varying intensity [6], [5].

Due to anatomical localization at the gastroesophageal junction, tumor progression often leads to early functional impairment, nutritional deficiency, and deterioration of general condition. Effective postoperative analgesia represents a fundamental component of surgical oncology, since inadequate pain control is directly associated with increased postoperative complications, delayed mobilization, prolonged hospital stay, impaired rehabilitation, and reduced quality of life [6], [5].

According to global oncological statistics, the burden of malignant neoplasms continues to rise, and a significant proportion of patients require palliative and supportive care services [7], [8].

Nevertheless, despite the development of evidence-based clinical guidelines for postoperative pain management, numerous studies demonstrate that insufficient analgesia remains a persistent problem even in advanced healthcare systems, where up to 70–80% of patients report moderate to severe postoperative pain [1], [2].

In oncologic surgery, the intensity and duration of postoperative pain are directly proportional to the extent of surgical trauma and may influence long-term functional outcomes. Therefore, a comprehensive evaluation of the determinants of postoperative pain intensity in patients with cardioesophageal cancer is of substantial clinical and practical importance.

## Aim of the study

To conduct a comparative analysis of postoperative pain intensity in patients with cardioesophageal cancer depending on surgical access, tumor phenotype, and clinical characteristics, and to evaluate the effectiveness of multimodal analgesia.

## Materials and Methods

A total of 85 patients with cardioesophageal cancer who underwent open surgical treatment were included in the study (57 men, 38 women; mean age 56.4 ± 0.6 years). According to ASA classification, 49.1% had grade IV risk and 44.5% had grade III risk. The majority of tumors were adenocarcinomas (92.9%), while 7.1% were squamous cell carcinomas.

Patients were divided into two groups based on surgical access: thoracophrenicolaparotomy (n=45) and combined thoracotomy with laparotomy (n=40). Postoperative pain intensity was assessed using the Numeric Rating Scale (0–10 points). Adequate analgesia was defined as pain ≤4 points.

Multimodal analgesia included nonsteroidal anti-inflammatory drugs (ketonal, analgin) combined with opioid analgesics (tramadol or morphine). In 13 patients, continuous regional analgesia with 0.5% novocaine infusion via microirrigator was applied.

Statistical analysis was performed using descriptive methods, and results were interpreted comparatively across surgical and clinical variables.

**Results**

The analysis of hospital statistical data for 2023 (State Statistics Committee, Form No. 07) shows that in Uzbekistan, on average, more than 8,000 oncology patients annually require palliative (hospice) care. Due to the unresolved issue of hospice organization and the insufficient material and technical resources regarding variations in analgesic methods and approaches, the problem of chronic pain syndrome remains far from being resolved.

Given the development of clinical manifestations of chronic pain syndrome depending on the method of surgical or combined treatment, particular importance is attached to the study of postoperative pain syndrome (POPS) in patients with malignant neoplasms.

A considerable number of studies worldwide have been devoted to the issue of adequate postoperative analgesia. The available findings of various authors have made it possible to formulate evidence-based clinical recommendations for postoperative pain control. Nevertheless, many researchers agree that the problem remains unresolved even in countries with advanced healthcare systems, where up to 80% of patients experience pain of varying intensity in the postoperative period. In oncology, effective pain control is one of the key determinants of successful surgical treatment, being directly proportional in intensity and duration to the frequency of complications, prolonged rehabilitation, and deterioration in patients' quality of life.

In order to identify optimal ways to improve postoperative analgesia, the degree of analgesic effectiveness was assessed after open surgical interventions for cardioesophageal cancer in 85 patients. There were 57 men (67.0%) and 38 women (33.0%). The mean age was 56.4 ± 0.6 years. According to anesthesiological assessment, 49.1% of patients had ASA grade IV risk and 44.5% had ASA grade III risk. Upon admission, the general condition according to the Karnofsky Performance Status ranged from 70% to 90% (ECOG 0–1).

Postoperative analgesia was administered according to the modern principle of multimodal therapy, combining nonsteroidal anti-inflammatory drugs (ketonal up to 200 mg/day, analgin 200 mg/day) with opioid analgesics (tramadol up to 30 mg/day or morphine up to 20 mg/day). In 13 patients, continuous regional analgesia with 0.5% novocaine (up to 80 ml) was delivered via a microirrigator placed in the paravertebral tissue near the root of the small intestine mesentery.

Patients assessed the intensity of postoperative pain using the Numeric Rating Scale (NRS) from 0 to 10 points. Two study groups were formed depending on surgical access: thoracophrenicolaparotomy (n=45) and separate thoracotomy plus laparotomy (n=40).

The adequacy of analgesia was evaluated by comparing pain intensity in each group with the upper threshold of 4 points, which according to international standards corresponds to adequate analgesia. On the first postoperative day, pain intensity ranged from 2 to 8 points, requiring a personalized analgesic strategy (table 1).

The highest pain intensity was observed in patients who underwent thoracophrenicolaparotomy. In this group, the mean pain intensity was 5 points (maximum 8), and 91.1% of patients experienced significant pain on the first postoperative day. This was mainly associated with the two-cavity surgical access involving resection of the cartilaginous portions of the 7th–8th ribs on the left side

and subsequent phrenicotomy to the diaphragmatic esophageal ring. In contrast, 47.5% of patients who underwent thoracotomy plus laparotomy reported pain.

**Table 1.** Pain Intensity Indicators Depending on the Type of Surgical Access (n = 85)

| Surgical Access / Tumor Type | Mean POPS Intensity (NRS) | Number of Patients with POPS |
|---|---|---|
| Thoracophrenicolaparotomy | 5 (3–8) | 41 (91.1%) |
| Thoracotomy + Laparotomy | 4.1 (3–7) | 19 (47.5%) |
| AC (Adenocarcinoma) | 5.3 (4–8) | 58 |
| SCC (Squamous Cell Carcinoma) | 4.2 (2–7) | 4 |
| Type I | 3.8 (3–6) | 11 |
| Type II | 5.4 (3–8) | 18 |
| Type III | 4.1 (3–6) | 56 |
| Overall Mean | 4.6 | — |

Note: In each group, the number of patients who experienced severe pain (NRS > 6 points) is indicated.

High pain intensity was predominantly characteristic of patients after thoracophrenicolaparotomy. Thus, thoracic surgical procedures performed via different approaches are associated with a risk of developing chronic pain syndrome.

Analysis of gender and age factors did not reveal a significant influence on pain intensity. The incidence of postoperative pain was 62.6 ± 0.19% in men and 67.4 ± 0.22% in women (difference 5.2 ± 0.11%, $p<0.05$). However, the pain sensitivity threshold on the NRS was one point higher in men (4.9 ± 0.2) compared to women (3.7 ± 0.3). No significant differences in pain intensity or frequency were identified across age groups.

In 13 patients who received continuous regional analgesic perfusion in the early postoperative period, pain intensity did not exceed 2 points, and opioid requirements significantly decreased even on the first postoperative day.

The results indicate that multimodal analgesia combining NSAIDs and opioids significantly improves postoperative pain control. However, despite these improvements, pain intensity exceeded the adequate analgesia threshold (>4 points) in the majority of patients.

A clear relationship between pain intensity and surgical volume was observed. Among 85 patients, 46 (41.8%) experienced pain of 4–8 points; these cases were associated with stage III tumors and extended combined surgical procedures.

Monitoring postoperative pain using the Numeric Rating Scale allows identification of patients with inadequate analgesia and facilitates timely corrective measures. Improvement of regional analgesia techniques and implementation of patient-controlled analgesia may enhance individualized pain management and improve medical and psychological rehabilitation outcomes.

## Conclusion

The findings demonstrate the variability of clinical manifestations in cardioesophageal cancer. Despite clinical polymorphism, symptoms are associated with tumor type and histological

phenotype. Regardless of tumor localization relative to the cardial sphincter, most patients had a satisfactory general condition, with 70.7% having a Karnofsky score above 70%. Dysphagia was present in 92% of patients, and pain syndrome in 75%. Adenocarcinoma was associated with higher pain intensity and anemia rates, whereas squamous cell carcinoma was more frequently associated with dysphagia. Although tumor grade influenced symptom frequency, no statistically significant correlation between histological grade and clinical manifestations was established.

Overall, postoperative pain intensity was more closely associated with the extent of surgical trauma than with gender or age factors. Systematic monitoring of postoperative pain is essential for optimizing analgesic strategies in clinical oncology.

## References

[1] J. L. Apfelbaum, C. Chen, S. S. Mehta, and T. J. Gan, "Postoperative pain experience: Results from a national survey suggest postoperative pain continues to be undermanaged," Anesthesia & Analgesia, vol. 97, no. 2, pp. 534–540, 2003.

[2] R. Chou, D. B. Gordon, O. A. de Leon-Casasola, et al., "Management of postoperative pain: A clinical practice guideline from the American Pain Society," The Journal of Pain, vol. 17, no. 2, pp. 131–157, 2016.

[3] T. J. Gan, "Poorly controlled postoperative pain: Prevalence, consequences, and prevention," Journal of Pain Research, vol. 10, pp. 2287–2298, 2017.

[4] H. Kehlet and J. B. Dahl, "Anaesthesia, surgery, and challenges in postoperative recovery," The Lancet, vol. 362, pp. 1921–1928, 2003.

[5] F. Lordick, K. Shitara, and Y. Y. Janjigian, "New agents on the horizon in gastric and gastroesophageal junction cancer," Journal of Clinical Oncology, vol. 40, no. 16, pp. 1767–1778, 2022.

[6] E. C. Smyth, M. Nilsson, H. I. Grabsch, N. C. van Grieken, and F. Lordick, "Gastric cancer," The Lancet, vol. 390, pp. 635–648, 2017.

[7] H. Sung, J. Ferlay, R. L. Siegel, et al., "Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide," CA: A Cancer Journal for Clinicians, vol. 71, no. 3, pp. 209–249, 2021.

[8] World Health Organization, "Palliative care: Key facts," Geneva, Switzerland: WHO, 2020.