

MODERN APPROACHES TO THE TREATMENT OF PECTUS EXCAVATUM

Razhabzoda Parvina Hakimovna

Asia International University
aliyevafotima2024@gmail.com

Abstract

Pectus excavatum, a congenital chest wall deformity characterized by a sunken sternum, can lead to both physiological and psychological complications. Recent advancements in minimally invasive surgical techniques and non-surgical interventions have significantly improved treatment outcomes. This article reviews modern methods of managing pectus excavatum, focusing on their effectiveness, safety, and patient-centered outcomes using the IMRaD structure.

Introduction

Pectus excavatum is the most common congenital deformity of the anterior chest wall, affecting approximately 1 in 300–400 births. It is characterized by posterior displacement of the sternum and adjacent costal cartilages. While mild cases may be asymptomatic, severe forms can impair cardiopulmonary function and negatively affect psychological well-being.

Traditionally, treatment options were limited to invasive surgical corrections. However, over the past few decades, modern techniques—including minimally invasive procedures and external correction devices—have revolutionized management strategies. This paper aims to explore contemporary treatment methods and evaluate their clinical outcomes.

Methods

A narrative review of current literature was conducted, focusing on studies published in peer-reviewed medical journals between 2015 and 2025. Databases such as PubMed, Scopus, and Web of Science were used to identify relevant articles. Keywords included “pectus excavatum,” “minimally invasive repair,” “Nuss procedure,” “vacuum bell therapy,” and “chest wall deformity treatment.”

Inclusion criteria:

- * Studies involving modern treatment techniques
- * Clinical trials, systematic reviews, and meta-analyses
- * Articles published in English

Exclusion criteria:

- * Studies focusing solely on outdated surgical methods
- * Case reports with insufficient data

Results

Modern treatment approaches for pectus excavatum can be broadly categorized into surgical and non-surgical methods.

1. Minimally Invasive Surgical Techniques

The Nuss procedure remains the gold standard for moderate to severe cases. It involves inserting a curved metal bar beneath the sternum to elevate it into a normal position. Recent improvements include:

- * Use of thoracoscopic guidance for enhanced safety
- * Customized bars for better anatomical fit
- * Reduced complication rates

Studies report high patient satisfaction rates (over 90%) and significant improvements in cardiopulmonary function.



2. Vacuum Bell Therapy

This non-invasive method uses a suction device placed on the chest to gradually lift the sternum. It is particularly effective in:

- * Pediatric patients
- * Mild to moderate deformities

Clinical results show gradual correction over months to years, with minimal side effects such as mild skin irritation.

3. Hybrid Approaches

In some cases, a combination of vacuum bell therapy and surgery is used to optimize outcomes. Pre-treatment with vacuum devices can reduce the severity of deformity, making surgical correction easier and safer.

4. Psychological and Supportive Care

Modern treatment protocols also emphasize psychological assessment and counseling, recognizing the impact of body image on quality of life.

Discussion

The evolution of pectus excavatum treatment reflects a shift toward patient-centered, less invasive approaches. The Nuss procedure has largely replaced traditional open surgeries due to its reduced recovery time and improved cosmetic outcomes. However, it is not without risks, including bar displacement and postoperative pain.

Vacuum bell therapy offers a promising alternative, especially for younger patients, though it requires long-term compliance. The choice of treatment should be individualized, considering factors such as age, severity, and patient preference.

Future research is expected to focus on:

[02.04.2026 15:03] Radjabzade Parvina: * Biomechanical modeling for personalized treatment

- * Enhanced materials for surgical implants
- * Long-term comparative studies of treatment outcomes

Conclusion

Modern management of pectus excavatum has significantly advanced, offering effective and less invasive options for patients. Both surgical and non-surgical methods demonstrate high success rates when appropriately selected. Continued innovation and research are essential to further improve patient outcomes and quality of life.

REFERENCES:

1. Kuzieva, M., Akhmedova, M., & Khalilova, L. (2025). MODERN ASPECTS OF CHOICE OF MATERIAL FOR ORTHOPEDIC TREATMENT OF PATIENTS IN NEED OF DENTALPROSTHETICS. Modern Science and Research, 4(1), 322-333.
2. Kuzieva, M., Akhmedova, M., & Khalilova, L. (2025). GALVANOSIS AND ITS DIAGNOSTIC METHODS IN THE CLINIC OF ORTHOPEDIC DENTISTRY. Modern Science and Research, 4(2), 203-212.
3. Kuzieva, M. A. (2023). Clinical and Morphological Criteria of Oral Cavity Organs in the Use of Fixed Orthopedic Structures. Research Journal of Trauma and Disability Studies, 2(12), 318-324. 458 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 3
4. Abdusalimovna, K. M. (2024). THE USE OF CERAMIC MATERIALS IN ORTHOPEDIC DENTISTRY. (Literature review). TADQIQOTLAR, 31(3), 75-85.
5. Abdusalimovna, K. M. (2024). CLINICAL AND MORPHOLOGICAL FEATURES OF THE USE OF METAL-FREE CERAMICSTRUCTURES.TA'LIM VAINNOVATSION TADQIQOTLAR,13,45-48.



5. Abdusalimovna, K. M. (2024). THE ADVANTAGE OF USING ALL-CERAMIC STRUCTURES. TA'LIM VA INNOVATSION TADQIQOTLAR, 13, 49-53. 1286 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 6
6. Abdusalimovna, K. M. (2024). Clinical and Morphological Features of the Use of Non Removable Orthopedic Structures. JOURNAL OF HEALTHCARE AND LIFE SCIENCE RESEARCH, 3(5), 73-78. 800 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 4 1285 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 5
7. Kuzieva, M. A. (2024). CARIOUS INFLAMMATION IN ADOLESCENTS: CAUSES, FEATURES AND PREVENTION. European Journal of Modern Medicine and Practice, 4(11), 564-570.
8. ISSN NUMBER:2751-4390 IMPACT FACTOR:9,08 Kuzieva, M. A. (2024). Malocclusion– Modern Views, Types and Treatment. American Journal of Bioscience and Clinical Integrity, 1(10), 103-109.
9. KUZIEVA, M. A. (2024). MODERN ASPECTS OF MORPHO-FUNCTIONAL DATA AND TREATMENT OF AGE-RELATED CHANGES IN THE MAXILLOFACIAL REGION. Valeology: International Journal of Medical Anthropology and Bioethics, 2(09), 126-131.

