

Evaluation of surgical and non-surgical interventions in pectus excavatum management: nuss procedure vs vacuum bell therapy

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Dear Editor,

Pectus excavatum (PE) is a congenital deformity characterized by a sunken sternum and costal cartilages, resulting in a concave chest wall appearance. It has a prevalence of 1 in 400 to 1 in 1.000 live births, predominantly affecting males. The deformity can lead to physiological complications, such as reduced cardiopulmonary function, and psychosocial distress, particularly during adolescence.¹

Traditionally, the Nuss procedure, a minimally invasive surgical technique, has been the standard treatment for moderate to severe cases of PE. This method involves the insertion of a concave metal bar beneath the sternum, which is then flipped to correct the depression. Studies have demonstrated its efficacy in achieving significant chest wall correction with minimal complications compared to open surgical techniques.²

However, non-surgical approaches, particularly vacuum bell therapy (VBT), have gained attention as alternative treatments for PE, especially for patients who either do not meet surgical criteria or prefer non-invasive options. VBT involves the use of a suction cup device that creates negative pressure to lift the sternum over time.³

The Nuss procedure is highly effective in correcting severe PE with documented improvements in Haller index (HI) and patient-reported outcomes. The correction achieved through this procedure is largely stable and results in high patient satisfaction due to the significant cosmetic and functional improvements observed. Nevertheless, the procedure carries risks such as bar displacement, infection, and potential damage to the heart and lungs, which although rare, necessitate careful patient selection and surgical expertise.⁴

VBT has emerged as a viable non-surgical option, particularly for younger patients and those with milder forms of PE. Studies indicate that the efficacy of VBT correlates with the duration and daily hours of usage, with optimal results seen in patients who adhere to a regimen of at least 6 hours daily

for a period extending beyond 12 months. A significant reduction in HI and improvements in the thoracic index have been reported, although the degree of correction is generally less pronounced compared to surgical intervention. Moreover, VBT is associated with fewer complications, primarily mild and transient skin changes, making it a safer option for patients unsuitable for surgery.^{5,6}

In conclusion, both the Nuss procedure and vacuum bell therapy offer effective solutions for the correction of pectus excavatum, each with distinct advantages and limitations. The choice between these treatments should be guided by the severity of the deformity, patient age, comorbidities, and personal preferences. The integration of these therapeutic options allows for a more personalized approach to managing PE, enhancing patient outcomes and satisfaction.

There is a need for more comprehensive, randomized controlled trials to compare these modalities and better delineate their long-term efficacy and safety profiles. Such data will be invaluable in refining treatment guidelines and enhancing patient care in pediatric surgery.

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.



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