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Correspondence

Letter to Editor in response to: The hidden (and fatty) side of vacuum bell by Tedde M

Dear Editor,

I would like to respond to Dr. Tedde's comments about the recently published study by Toselli et al. [1] and his concerns about the conservative treatment of pectus excavatum (PE) using the vacuum bell (VB). Dr. Tedde points out that, in his opinion, the effect of VB therapy is predominantly because of thickening of the chest wall by increasing pre-sternal adipose tissue in front of the sternum instead of remodeling the cartilage and bone of the sternum. Furthermore, he emphasizes this information is not mentioned in scientific reports nor on specific websites provided by health care providers and/or manufacturers. Finally, he concludes that because of this, patients are not properly informed about the treatment expectations when using VB therapy. We appreciate the opportunity to respond to these concerns.

Approximately 16 years ago, initial pilot studies describing use of VB therapy for PE patients were published with encouraging results [2,3]. There was even acquisition of CT scan images before and after suction application demonstrating how the VB immediately lifted the sternum and ribs thereby relieving compression of the heart [2]. After several small studies reported their experience with VB therapy, we published the first systematic retrospective study summarizing the results of 133 patients in 2011. Importantly, our study also included guidelines for a methodical VB treatment protocol, which we consider contributed to the improved success of VB treatment in our patients [4]. More recently, several reports including hundreds of PE patients using a similar treatment protocol have confirmed the efficacy of VB therapy with very similar results, particularly in properly selected patients [1,5–8]. These findings from multiple studies highlight two key points that I believe are over looked by Dr. Tedde's assessment: proper patient selection and proper treatment protocols are equally important for improved outcomes.

The concept of fat tissue enlargement creating the perceived correction of PE is limited in the literature being first reported just 2 years ago [9]. However, certain details of this study should be noted before drawing conclusions: low number of study patients (12), unclear patient selection, and not using a recommended treatment protocol. These latter two items are cornerstones for successful VB therapy. Another recent study included 27 patients, who underwent VB therapy for 17 months. Because of lack of treatment effect, they underwent surgical repair. Some of these patients demonstrated local skin irritation or hematoma, but interestingly preoperative imaging did not demonstrate pre-sternal fat tissue enlargement even in these patients that failed VB therapy [10].

With regard to disclosure about required use, potential results and side effects when using VB therapy, it is worth noting that all of these studies obtained mandatory IRB approval for consent to treat, study, and publish results. So, we completely agree that counselling before starting VB therapy, *as with surgery*, must always included a thorough discussion of the risks, benefits, and options with special attention given to the lower frequency of excellent results and the extended duration of therapy when offering VB therapy.

In conclusion, I, and many other surgeons around the world, still consider VB therapy a valid alternative for PE especially for younger patients with mild deformities and flexible chest walls. Further studies including larger sample sizes will help draw more significant conclusions to guide and optimize evidence-based changes when offering VB therapy.

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