Repair of pectus excavatum. Are we doing it better just to make it look better?

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In the beginning of the era of pectus excavatum surgery, only patients with the most severe forms of deformities were operated upon. The aim of the intervention was to release the compromised thoracic organs from the grip of the depressed sternum, and thus improve critically impaired cardiorespiratory function. The anatomical results were readily visible and the functional improvement was clinically evident.

As time passed, with the increasing experience and with the development of more effective and less traumatic procedures, the operative risk dropped dramatically and the operative indication for the repair of pectus excavatum was gradually extended to less severe deformities. Even so, it remains evident that most patients with advanced forms of the deformity indeed benefit physiologically from the repair and that the correction of mild deformities yielded but cosmetic improvement. The question as to whether moderate-to-severe sternal depressions may cause any functional restraint or even permanent physiological damage, which per se justifies surgical intervention, remained unanswered. This issue now bears special significance in providing informed consent, i.e. some parents may agree to surgery for the purpose to ‘cure’ the condition, i.e. improve cardiorespiratory function and/or eliminate foreseeable morbidity, but would not be in favour of an intervention purely for cosmetic reasons. The situation is further complicated by the stance of most insurance companies, which are reluctant to cover the expenses of reconstructive surgery done for purely cosmetic reasons.

There is a long line of studies that used primarily pulmonary, but also cardiac function tests, which attempted to prove the physiological value of pectus excavatum repair. Unfortunately, most, if not all, fell short of providing convincing proof that moderate-to-severe pectus excavatum may significantly impair cardiorespiratory function. The main difficulty which emerged in these studies was that such patients, the physiological parameters were not only after, but also before surgery were within the boundaries of accepted ‘normal’ values. The methods for evaluation also had the potential to be influenced by the patient’s subjective input. Unfortunately, the article ‘Improved cardio pulmonary exercise function after modified Nuss operation for pectus excavatum’ [1] by Tang et al. does not overcome these difficulties, and thus fails to provide definite conclusions.
First of all, very little information has been provided on the 49 operated patients representing the study population, and what we know, i.e. the Haller index and age, are presented as averages for the entire group. This leaves us uninformed of the number of patients with either 'very severe' or with 'mild' or 'moderate' deformities. Such outliers on either end of the spectrum may most significantly influence the answer to our key question: Are we doing any good for the group of patients with moderate-to-severe pectus excavatum?

The authors tried to overcome the vexing difficulty of demonstrating objectively improvement following pectus excavatum repair in patients. Most, if not all patients have normal physiological parameters even before surgical intervention. By comparing their values with a control group of 'matched' students who had no anterior chest wall anomaly was of little help. Again, unfortunately the only thing we know of this matching process is that the controls were of similar age and body index. That is not enough. Considering the relatively closed community from which the controls were recruited, they could have obtained additional data from both the study and the control groups. This would have allowed them a more appropriate individual matching. While it is noted that both groups were interrogated regarding habitual exercise and smoking habits, there is no information as to how this information was utilized in the study. Additional information, such as gender, lifestyle, professional and athletic activity, would have also been very helpful. As the information stands now, a tall marphanoid male student living a sedentary life may have been matched with the local female running champion.

The comparative analysis of cardiorespiratory changes a year following the operation revealed mixed results. Most individuals previously identified as having 'low-normal' stress-cardiac index and FEV1 showed modest improvement after the Nuss operation. However, these values still remained inferior to the values obtained in the 'normal' control group. Most of the relative values, however, did not change appreciably—some even declined. The final results may have also been influenced by the lack of information regarding any exercise programme in which the operated or the control patients may have been engaged, either spontaneously or by instruction during the observation period.

The study undoubtedly supports the view that repair of pectus excavatum may improve cardiopulmonary function, but just as several of its predecessors, it falls short of providing a definite proof which may be expected in the era of modern evidence-based medicine.

REFERENCE