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Commentary: A New Way to Gauge Pectus Severity

Hollis Johanson, MD, and Ikenna Okereke, MD

Pectus excavatum is a disorder which most thoracic surgeons will encounter at some point in their practices. The degree of cardiac compression in patients with pectus excavatum is an important measurement in assessing the need for operative repair. Typically the assessment is done using computed tomography of the chest. The widest transverse measurement of the chest is compared to the anterior-posterior distance to calculate the Haller index.¹ When determining whether surgery is needed or not, it is helpful to determine how significantly the heart is being compressed. Occasionally a patient may have significant exercise intolerance without a severe Haller index.² Oftentimes in these scenarios there is substantial cardiac compression, and surgical repair improves symptoms.

Many patients with pectus excavatum present at young ages. For this reason, exposure to repeated doses of ionizing radiation and possible development of malignancy is a reasonable concern.³ Parents frequently have as their first question whether computed tomography can be avoided, and the possible consequences of repeated scans. Daemen et al. have presented a novel method to assess the amount of cardiac compression caused by pectus deformities.⁴ In their study, a group of 61 patients with pectus excavatum had their degree of cardiac compression measured both by computed tomography and three-dimensional surface imaging. Cardiac compression was divided into Grade 0—No compression, Grade 1—Compression of the right ventricle only and Grade 2—Compression of the right ventricle and atrioventricular groove.⁵ Their findings were both robust and predictive. The three-dimensional imaging had a sensitivity and specificity of 0.76 and 1.00 respectively in the male and female model, and a sensitivity and specificity of 0.91 and 0.85 respectively in the male model.

Of note, the authors noticed that cardiac compression did not necessarily correlate with the presence of symptoms. This lack of correlation is a phenomenon that most surgeons have observed in their practices. Although not the focus of this study, there could be significant value in determining if another diagnostic test could have better ability to correlate imaging findings with symptomatic pectus excavatum.

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Central Message

Pectus excavatum has typically been gauged by computed tomography and the Haller index. The authors present a novel technique which avoids radiation to assess the degree of cardiac compression.

While limited by a small cohort size, the authors should be commended for developing a model to assess cardiac compression in patients with pectus deformities while avoiding ionizing radiation. This study will serve as a good beginning for further development of this three dimensional method. Larger cohorts will be able to determine which patients may be able to avoid radiation with accurate results. This work provides an exciting new development in the diagnosis and treatment of pectus excavatum. Any effort to reduce radiation exposure in young people should be encouraged, and the authors have provided a nice framework on which to build.

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