

Pectus Excavatum: A Matter of the Heart?

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INTRODUCTION

Pectus excavatum is a condition where the anterior chest wall is caved-in. It is the most common congenital chest wall anomaly and can easily go unnoticed in early childhood until puberty, where rapid progression occurs.¹ Here we present the case of a 17 year old female who presented with acute on chronic dyspnea likely due to severe pectus excavatum with restrictive lung pathology and cardiac compression.

CASE PRESENTATION

A17-year-old female with a past medical history of mild persistent asthma, systemic lupus erythematosus on hydroxychloroquine, and several months of dyspnea of unknown etiology presented to the hospital with acute hypoxic respiratory failure. She had recently been treated with azithromycin for presumed atypical pneumonia. Social history was notable for daily vaping with recent discontinuation prior to symptom onset. A chest computed tomography was performed as shown in figure 1. A Haller index (equation in figure 2) was performed showing severe pectus excavatum. Transthoracic echocardiogram showed normal left ventricular size and function, a mildly compressed right ventricle with normal function, and grossly normal valvular function. Hypoxia resolved during admission and was thought to be secondary to viral infection in the setting of restrictive lung pathology from pectus excavatum. Outpatient pulmonary function tests was performed and confirmed restrictive physiology. (Figure 3)

CASE PRESENTATION

Figure 1: A chest computed tomography was obtained showing normal lung fields without lung disease, but severe pectus excavatum (Haller index of 3.9) with mass effect on the right ventricle and right atrium as well as cardiac shift into the left chest.

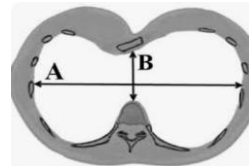


Figure 2: Haller Index Equation: $HI = A/B$. Normal <2.0 , Mild $2.0-3.2$, moderate $3.2-3.8$, severe >3.8 . Our patient's Haller index $218.9 \text{ mm} / 56.6 \text{ mm} = 3.9$ (indicating severe pectus).

PFT values	Normal Parameters	Patient's Values
FEV1	2.5-3.25	2.09
FVC	3.25-3.75	2.69
FEV1/FVC	>80	72
TLC	4.2- 4.8 L	4.03
DLCO	75-140%	57%

Figure 3: Pulmonary Function Testing (PFTs) showing restrictive lung pathology with mildly reduced total lung capacity (TLC) and decreased diffuse capacity of lung for carbon monoxide. FEV1 (forced expiratory volume in 1 second). FVC (forced vital capacity)²

DISCUSSION

- Pectus excavatum is typically a benign finding that does not require further management, however in rare cases it can lead to clinical symptomology.
- Surgical intervention criteria includes : Haller index >3.25 , restrictive lung disease, pulmonary compression, or other cardiac pathology with electrical, valvular, or compression involvement.²
- Given our patient's haller index of 3.9, restrictive lung disease, right ventricular compression she was referred to Cardiothoracic surgery for surgical intervention.

CONCLUSION

- Pectus excavatum can have a clinically significant impact on lung and cardiac function
- Once diagnosed, there is no standard follow-up recommended to monitor for progression, however PFTs and TTE should be considered in a patients with symptoms
- In the setting of new onset dyspnea or hypoxia, Pectus excavatum is an important differential to consider in adolescence where progression of pectus excavatum is most common and can masked by breast tissue in females.¹

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