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Large diaphragmatic hernia induced reversible heart failure

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Diaphragmatic hernias are typically congenital and happen during the fetal development stages. Diaphragmatic hernias can be classified into two types: Bochdalek and Morgagni. Bochdalek type is seen in this case and is defined where the stomach and small intestine contents are found in the thoracic cavity. Below we see a rare case in which a diaphragmatic hernia leads to a reversible cause of heart failure. This is a 50 year female with PMH of hypertension and diabetes presenting with worsening shortness of breath, on and off for the last three weeks. Patient denied any fever, chills, chest pain or wheezing. Shortness of breath with rest and exertion is associated. Physical exam showed mild JVD elevation and bilateral lower extremity trace edema. On admission, CXR showed right middle lobe pneumonia and large left sided diaphragmatic hernia. CT chest then confirmed the above and showed the diaphragmatic hernia penetrating posteriorly into the thoracic cavity. ECHO showed both grade three diastolic dysfunctions without concentric hypertrophy and reduced ejection fraction of 40%. BNP level was 748. Hemoglobin A1c was 6.8, on Metformin and Glipizide. Because of ECHO results, patient underwent a Lexiscan stress test in which it showed a high risk of CAD with possible inferior ischemia. Patient then underwent cardiac catheterization which confirmed an ejection fraction of 40% and only mild stenosis of 25% of the LAD. Patient started on Carvedilol and Lasix in the addition of Lisinopril that she was already on for hypertension. Patient was then referred to surgery for correction of the diaphragmatic hernia. Repeat ECHO three months post operatively showed that ejection fraction improved to 50% and diastolic dysfunction improved as well now only being Grade 1 diastolic dysfunction. Diaphragmatic hernia has been associated with respiratory complications but typically not cardiac. In this case, the patient was found to have both systolic and diastolic dysfunction which resolved with correction of the diaphragmatic hernia. Initially patient was thought to have an ischemic cardiomyopathy, but once cardiac catheterization was unremarkable this pointed more towards the diaphragmatic hernia. Additional concern was patient's history of diabetes with this potentially contributing to heart failure. Given that patient's hemoglobin A1c was 6.8, again this pointed towards the diaphragmatic hernia contributing to these findings. Given the increase in intra-thoracic pressure in the setting of the large diaphragmatic hernia, diastolic function is affected. Left ventricular filling is compromised during this stage of the cardiac cycle. Hypertension was of concern as well, but again, given the fact that the ECHO did not demonstrate any concentric hypertrophy and the reversal after corrected surgery, we can conclude that this was secondary to the diaphragmatic hernia.

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