REVERSAL OF CHRONIC ANTHRACYCLINE-INDUCED HEART FAILURE: A CASE REPORT

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ABSTRACT

Anthraclycline chemotherapy is a major cause of medication-induced cardiomyopathy. The cumulative dose typically determines the likelihood of toxicity, 1 which is attributed to the production of toxic oxygen free radicals. Vacuolation, irreversible ultrastructural damage, and the replacement of myocytes with fibrous tissue eventually result, which cause late-onset dilated cardiomyopathy and chronic heart failure which is usually considered to be irreversible. We report the case of a woman whose chronic anthracycline-induced cardiomyopathy was treated with appropriate heart failure medication. The patient’s clinical status improved thereafter, with normal LV systolic function( EF-65.%).

KEYWORDS: Anthracycline chemotherapy, Vacuolation, irreversible ultrastructural damage.

CASE REPORT

This 53 year old female had presented with complaints of bloody discharge from the right breast in August 2004 and she was further evaluated. Ultrasound chest and Mammogram suggestive of mass 8x6cm in right breast. FNAC done and diagnosed as Carcinoma right breast - Infiltrating ductal carcinoma. She received 4 cycles of Adriamyci, cyclophosphamid regimen chemotherapy + 1 cycle of Mitotax (September 2004 - December 2004). She underwent Right Mastectomy with Level I axillary clearance on 21.02.2005. HPE showed Infiltrating Ductal Carcinoma, IHC showed ER / PR - Positive and Her 2 Neu -Negative, She received radiotherapy, a total dose of 50Gy in 25 fractions.

She received oral hormone therapy with Tamoxifen from April 2005 to April 2010.

She presented with complaints of fatigue, breathlessness in December 2015 and was evaluated. Echo cardiographic done on 30.12.2015 showed dilated cardiomyopathy (ischemic / non ischemic). Left ventricle dilated and shows normal thickening and global hypokinesia of LV. LV systolic dysfunction (moderate) EF-35%. Diastolic dysfunction + impaired relaxation. All valves are normal. Left pleural fluid for cytology done on 02.01.2016 showed negative for malignant cells. 64 slice whole body FDG PET CT scan done on 07.01.2016 showed post right mastectomy status. No metabolically active residual or recurrent lesions in the right chest wall and axilla. Diffuse metabolically active nodular pleural thickening in left upper and lower lobe with moderate pleural effusion - ? primary pulmonary malignancy - ?? diffuse pleural metastasis. Metabolically active mediastinal and bilateral interlobar lymph nodal metastasis. Metabolically active left level IV / supraclavicular, anterior supradiaphragmatic, perigastric, right internal iliac and external iliac lymph nodes – metastasis. Trucut biopsy from pleural based nodular mass done on 12.01.2016. HPE showed consistent with metastatic adenocarcinoma, primary breast. IHC - ER positive, PR positive, Her 2 neu negative. Consultant Cardiologist was consulted and managed with cardiac medications (diuretics, decongestant, arbs, beta blockes). She was started on 1st salvage chemotherapy with Pacliall and Carboplatin from February 2016, completed 4 cycles April 2016. Echocardiogram done on 11.03.2016 showed normal chambers dimension. No regional wall motion abnormality seen at rest. Normal LV systolic function. Grade I LV diastolic dysfunction.

No pulmonary hypertension. No pericardial effusion. Normal study. EF-65.85%. Follow up PET CT whole body done on 21.04.2016 (post 4 cycles). Compared to previous PET CT scan performed elsewhere on 07.01.2016, there is interval no recurrence in anterior chest wall.
DISCUSSION

Anthracycline-induced dilated cardiomyopathy is categorized as acute or chronic. Acute anthracycline cardiomyopathy, which is usually viewed as reversible, has a prevalence of about 11% and typically develops within 2 to 3 days of anthracycline exposure. In affected patients, the acute cardiomyopathy manifests itself as chest pain secondary to myopericarditis, which is thought to be due to myocardial edema. Overt LV failure is a rare consequence of acute toxicity. In contrast, chronic anthracycline cardiomyopathy is considered to be irreversible and is associated with a 1-year mortality rate of 50%. Deaths typically result from congestive heart failure. 2 The prevalence of chronic anthracycline cardiomyopathy is approximately 1.7%. This form of the cardiomyopathy can develop within 30 days of exposure or as long as 17 years after exposure. 3 The longer it takes heart failure symptoms to occur after chemotherapy.

The histologic features of anthracycline-induced cardiomyopathy include patchy myocardial interstitial fibrosis, scattered vacuolated cardiomyocytes, distention of the sarcoplasmic reticulum, partial or total loss of myofibrils, and myocyte vacuolar degeneration. As a principal mechanism of heart failure, anthracyclines generate reactive oxygen species and lipid peroxidation, leading to increased oxidative stress. 4 In addition, the downregulation of structural proteins (including actin and myosin) after anthracycline exposure has been implicated in anthracycline cardiotoxicity.

The recommended therapeutic regimen, including β-blockers, ACE inhibitors, and aldosterone receptor blockers, is similar to regimens for other types of nonischemic cardiomyopathy. Cardiac transplantation alone has been shown to increase long-term survival rates in patients whose primary cancer has been cured. Cardiac resynchronization therapy should be offered to patients with a QRS interval wider than 120 msec, because this therapy has been shown to improve LVEF and functional capacity. 4,5 Our patient had chronic anthracycline toxicity after 11 years of anthracycline exposure now she presented with NYHA class IV heart failure. After appropriate continued medical management for 6 months, she eventually regained NYHA class I functional status. The reversal of acute anthracycline-induced cardiomyopathy has been reported. 7,8 Conventional wisdom suggests that patients with the chronic form of this cardiomyopathy require cardiac transplantation; however, aggressive medical management might be a valid alternative in certain patients, as in ours. Furthermore, the absence of replacement fibrosis on myocardial biopsy might be a marker for the reversal of chronic anthracycline-induced LV dysfunction. At minimum, the case of our patient shows promote recovery from heart failure due to chronic anthracycline-induced cardiomyopathy, patient’s return to medical therapy alone.

REFERENCES