

Trastuzumab: “HER2-Positive Savior or Cardiac Nightmare?”

Dylan Lopez, MS4 Eddy Valdez, MD, Rafael Otero, MD, Henry Kwang, MD
 University of Texas – Rio Grande Valley
 Valley Baptist Medical Center – Harlingen, Texas

INTRODUCTION

The discovery of the human epidermal growth factor receptor 2 (HER2) and the later development Trastuzumab, a monoclonal antibody targeting HER2, revolutionized the management of breast cancer. When added to standard chemotherapy, Trastuzumab significant increases both disease-free survival and overall survival in HER2-positive breast cancer and continues to be a cornerstone treatment option for these patients. However, Trastuzumab and other monoclonal antibodies that target HER2 carry a risk of inducing cardiotoxicity in patients.

CASE DESCRIPTION

A 51-year-old woman with history of stage 1 triple-positive right-sided invasive ductal carcinoma breast cancer presented for follow-up in oncology clinic complaining of increasing fatigue and shortness of breath without signs of peripheral edema. Her oncologic history was significant for a lumpectomy with adjuvant radiation therapy. She has completed 4 cycles of adjuvant chemotherapy consisted of doxorubicin, cyclophosphamide, paclitaxel, along with Trastuzumab every 21 days. The patient tolerated the first cycles of chemotherapy without any complaints. However, after 10 cycles of trastuzumab, patient started to notice shortness of breath and fatigue. Cardiotoxicity was considered and a 2D echocardiogram was performed and demonstrated an ejection fraction of 25% with left ventricular enlargement and mitral valve regurgitation. Trastuzumab was immediately discontinued and the patient was placed on medical management for systolic heart failure with plans for AICD placement soon.

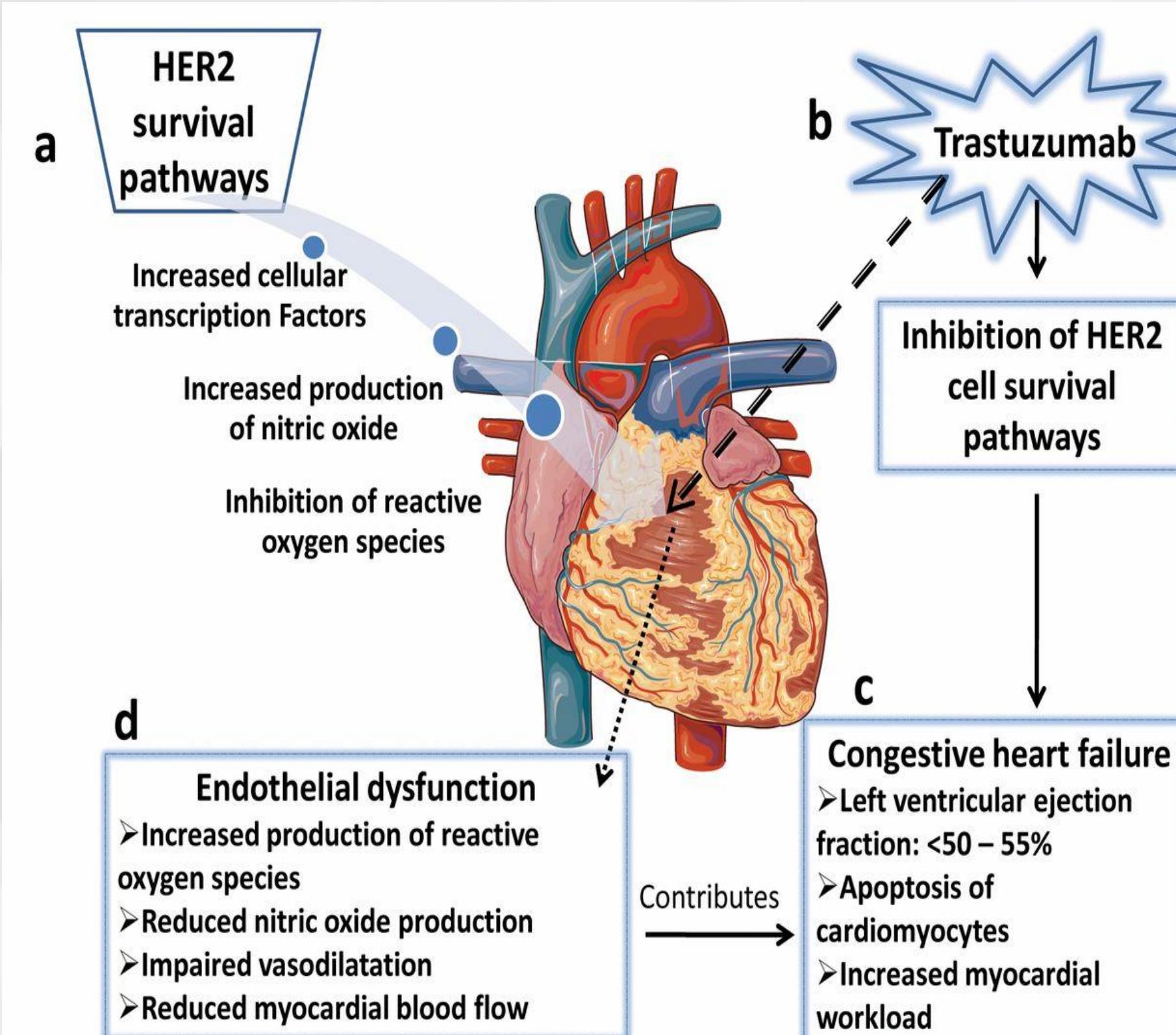
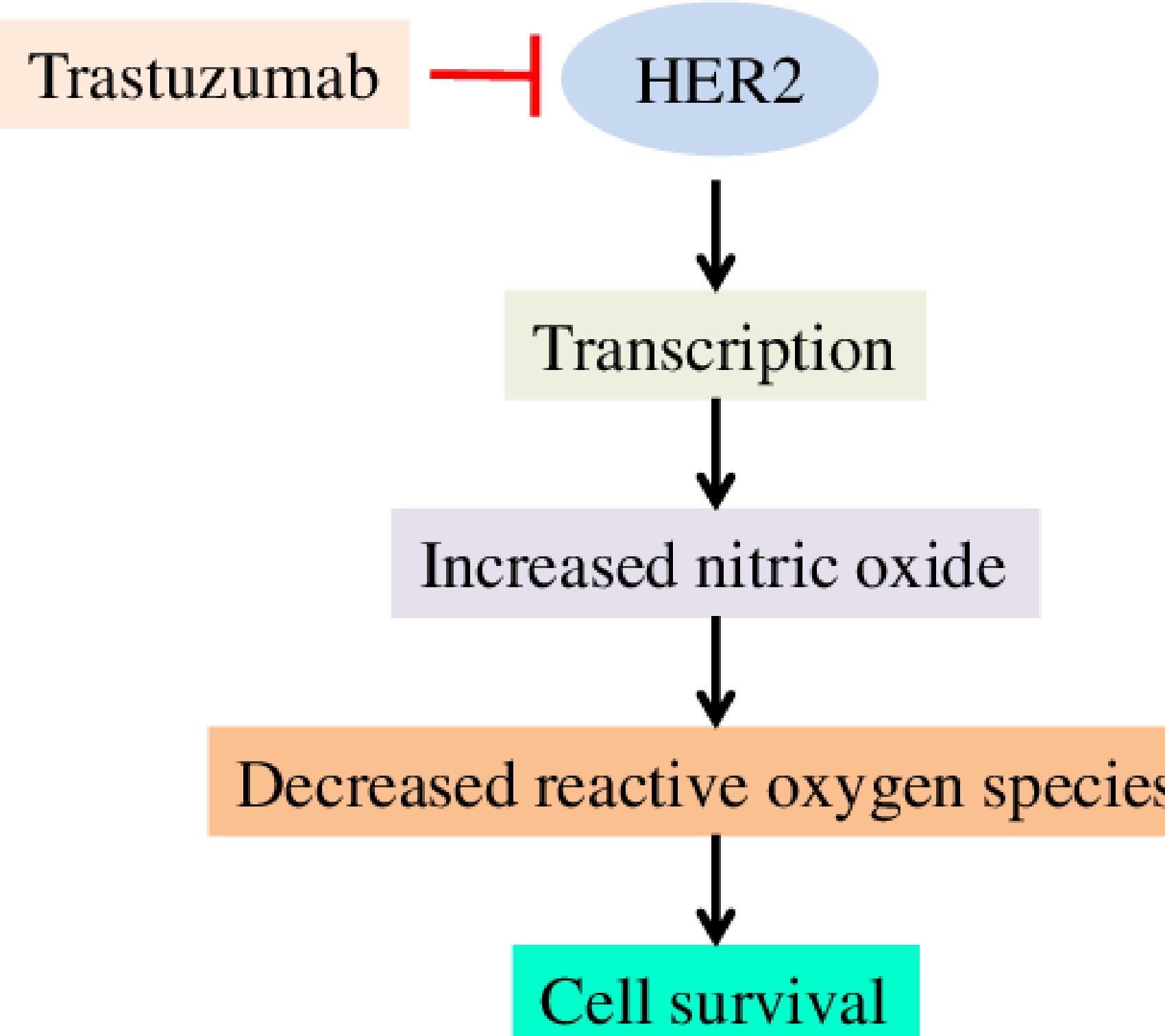


Figure 3. Diagram showing effects of HER2 on cardiac tissue and how Trastuzumab induces cardiotoxicity².



1 Mechanism of trastuzumab-induced cardiotoxicity (F15)
 Figure 2. Schematic of mechanism of Trastuzumab induced cardiotoxicity¹

CONCLUSIONS

Despite not having a prior history of cardiac disease, our patient experienced heart failure symptoms and was found to have reduced ejection fraction and unfortunately had to stop Trastuzumab. Trastuzumab-related cardiotoxicity has a higher chance of occurring in patient with history of obesity, hypertension, previous cardiac disease, and with cumulative dose of trastuzumab. Our case demonstrates the importance of monitoring for signs and symptoms of heart failure while administering trastuzumab. Although the specific frequency of cardiac monitoring is not defined by guidelines, experts do recommend serial echocardiograms to evaluate left ventricular function. Fortunately, unlike cardiotoxicity from anthracyclines, Trastuzumab-related cardiotoxicity is potentially reversible and can also respond to standard medical heart failure management. Although Trastuzumab has been very effective for the treatment of HER2-positive breast cancer, physicians must be aware of the potential serious adverse events and adjust management accordingly.

REFERENCES

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DISCLOSURE

The Authors of this poster do not have any financial relationships to disclose.