

Practical monitoring approach with multi-modality imaging and biomarkers

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ABSTRACT

BACKGROUND: Reversibility of cardiac function after cardiotoxic treatment is the main issue of cancer patient's survival. By cardiac therapy, complete LVEF recovery is observed only in 2/3 of patients.

AIM: Practical monitoring approach with multi-modality imaging and biomarkers is proposed in 2 clinical cases of breast cancer women with manifesting cardiomyopathy and HF in order to evaluate LV recovery and cardioprotective treatment effectiveness.

CASE DESCRIPTION: Both patients had cardiotoxicity (CT) risk with previous anthracycline and radiation (5 yrs ago) without CVD history. In 2018-2019 both patients had disease prolongation. Baseline LVEF was normal.

On admission 1st woman on Trastuzumab (13 courses) presented with symptomatic HF, dilated left chambers, LVEF 48%, wall hypokinesis and NTproBNP 5350 pg/ml, hsTnT 0.009 ng/dl, 2nd - after 4 doxorubicin + 8 taxane with HF symptoms, LVEF 44%, IVS, inferior wall hypokinesis, NTproBNP 6850 pg/ml, hsTnT 0.025 ng/dl. Cancer therapy was discontinued in both cases. Patients were started on BB, ACEI, diuretics with drugs doses titration, TTE monitoring. On 6-month follow-up 1st pt demonstrated left heart volumes reduction with EF recovery to 54%, NTproBNP decrease to 290 pg/ml; 2nd - EF 40%, NTproBNP 5500 pg/ml.

CMR: 1st patient EGE - no edema and inflammation, LGE - non-significant fibrosis in lateral wall. 2nd patient EGE - hyperemia, edema in basal LV segments, LGE - fibrosis in IVS, EF 36%.

CONCLUSIONS: As in this case of breast cancer women with cardiomyopathy and HF, CMR with serial measurements of NT-proBNP can be used to determine the stage and degree of myocardial damage, confirm LV recovery, which requires a diverse treatment strategy and affects patients' prognosis.

CASE SUMMARY

A previously healthy 2 breast cancer patients 39 and 48 years old without history of cardiac risk factors or cardiovascular diseases presented to hospital with signs and symptoms of heart failure.

Both patients had cardiotoxicity risk with previous anthracyclines and radiation therapy (5 years ago).

In 2018-2019 both women had disease prolongation.

LVEF before cancer treatment was within normal range in both cases.

On hospital admission they had dyspnea on exertion, tachycardia and edema of legs.

ECG showed sinus tachycardia in both patients. Blood hematology, biochemistry and urine were within normal limit levels.

Standard HF treatment (b-blockers, angiotensin-converting-enzyme inhibitors, AA and loop diuretics) was started in both patients.

Baseline characteristics and cancer treatment

Breast cancer	1 patient	2 patient
Localization	Right-sided	Left-sided
BC Type	Er(+)/PR(+) Her2neu+	Er(+)/PR(+) Her2neu-
BC Stage	pT2N1M0	pT2pN0M0
Doxorubicin cum, mg/m ²	300	400
Paclitaxel	+	+
Trastuzumab	-	-
Radiation dose, Gr	50	46
Surgery	+	+
History of CV diseases	-	-
HF on admission, NYHA	III	III
LVEF on admission, %	48	44
Heart rate, beats/min	105	110
Blood pressure, mm Hg	110/70	100/65
Age, years	39	48

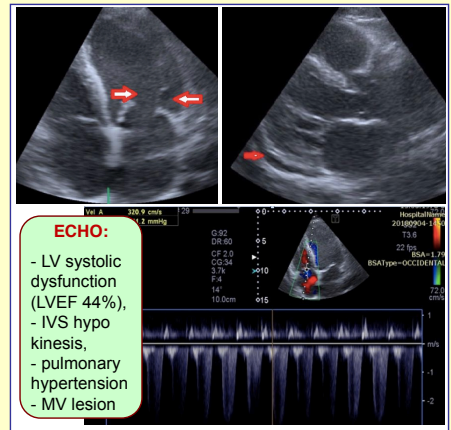
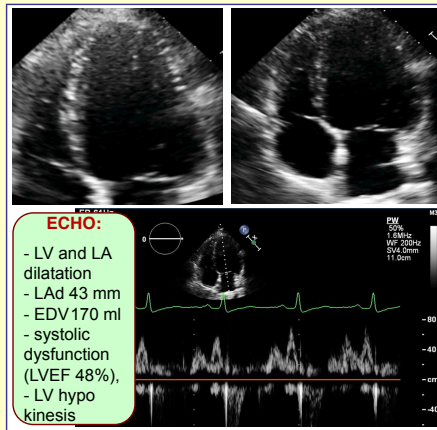
INTRODUCTION

- Reversibility of cardiac function after cardiotoxic treatment is the main issue of cancer pts survival
- By cardiac treatment, complete LVEF recovery is observed only in 2/3 of patients
- We describe 2 clinical cases of breast cancer women with cardiomyopathy and manifesting HF
- Practical monitoring approach with multi-modality imaging and biomarkers is proposed in order to evaluate LV recovery and cardioprotective treatment effectiveness

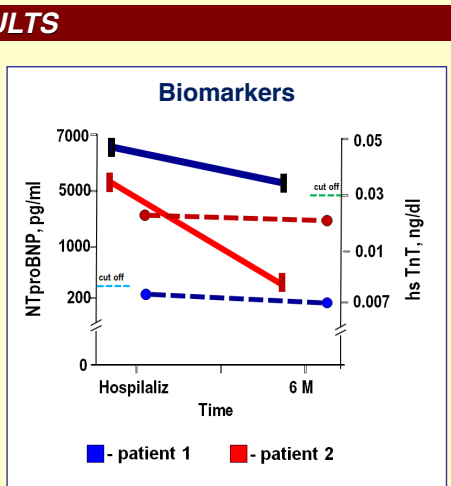
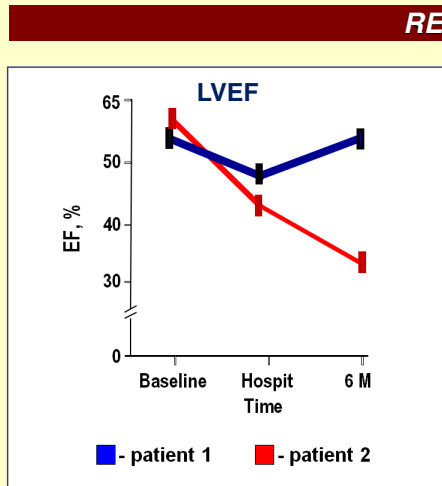
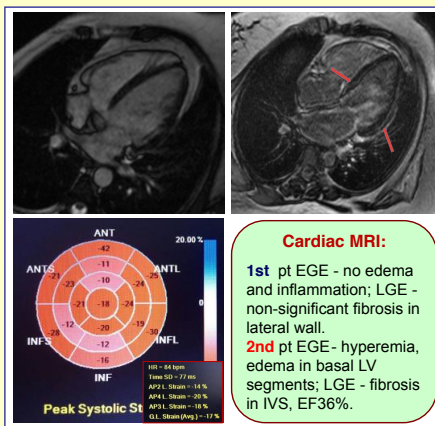
AIM

How to monitor breast cancer patient with cardiotoxic LV dysfunction and non-recovery of cardiac function by multi-modality imaging (TTE, GLS, CMR) and biomarkers (NT-pro-BNP, hsTnT)

1 PATIENT ECHOCARDIOGRAPHY 2 PATIENT



RESULTS



FOLLOW-UP

TREATMENT: HF treatment with b-blockers, ACEI, AA and loop diuretics with doses corrections was given up for 6 months to both pts.

During follow-up at 6 month:

Patient 1 presented asymptomatic, with HR 70 bpm; LV EF 52% confirmed by echocardiography, however GLS of several inferior and anterior LV segments remained low.

Patient 2 - slight HF symptoms, whereas LV function was not recovered (EF 36%).

CONCLUSION

1. Breast patients with cardiotoxicity need a close FU with heart function control.
2. Multi-modality monitoring approach is proposed in patients with reduced or non-recovered EF on 6-month FU.
3. CMR with serial measurements of NT-proBNP is needed to confirm LV recovery and predict the patient's prognosis that requires diverse treatment strategy.
4. Prolonged HF treatment and long-term cardiac monitoring are required to achieve LV function recovery in breast cancer patients with cardiotoxicity.

No conflict of interest.

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