

Coronary and valvular disease in patient treated for Hodgkin lymphoma

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For many cancers, chest radiation remains an important component of the treatment regimen. Till recent it was believed that the heart is radioresistant and that it can be damaged only with high doses of radiation >30Gy. However it is proved that chest radiation can induce coronary artery disease, valvular heart disease, pericardial disease, conduction system abnormalities, and myocardial fibrosis.^{1,2}

Risk factors for radiation heart disease are radiation of anterior or left lateral thorax, high cumulative dose of radiation (>30 Gy), younger patients (<50 years), high daily radiation dose (>2Gy), tumor localized in the region of neck or heart, lack of shielding, concomitant chemotherapy (with antracyclines), and presence of conventional risk factors for cardiovascular diseases (diabetes, smoking, overweight, hypertension, high blood lipids, and already present cardiac disease).¹

Female patient, 43 years of age, was admitted to Clinical center of Serbia complaining of anginal pain, occasionally at night. The pain was accompanied by dyspnoea. She begun to feel chest discomfort since she was 40 years of age. She had no conventional risk factors for cardiovascular diseases. When she was 30 years old she was treated with chemotherapy and radiotherapy for Hodgkin lymphoma. Several previous years she was hospitalized twice because of congestive heart failure. She

was treated with beta blockers, ACE inhibitors (ACEI), diuretics. Because of losing weight PET scan was conducted and accumulation of RF in left tonsil described. It was the same finding as two years ago. Haematological consilium stated that here were no contraindications for application of antiplatelet therapy or operative treatment.

At admission objective findings were almost normal except mild systolic murmur at heart apex. Blood pressure was 120/80mmHg.

Figure 1 shows her ECG.

Echocardiographic measures were: left ventricle end-diastolic dimension (LV EDD) 5.8cm left ventricle endsystolic dimension (LV ESD) 3.7cm LV EF 65%, good regional kinetics of walls, left atrium (LA) 4.7cm, right ventricle (RV) 2.0cm, SPRV 45mmHg. Aortic valve seemed normal, aortic regurgitation was 2+. Mitral leaflets were with moderate fibrotic changes, moderately calcified annulus mitral regurgitation 3+; tricuspid regurgitation 2+.

Coronary arteriography: left main stenosis 65%, proximal right artery stenosis 65%. circumflex artery without stenosis.

Patient was referred to another center and refused performing cardiac surgery. In our clinic she was again presented to cardio-surgical consilium. It was decided that revascularisation should be done, but no intervention on heart valves.

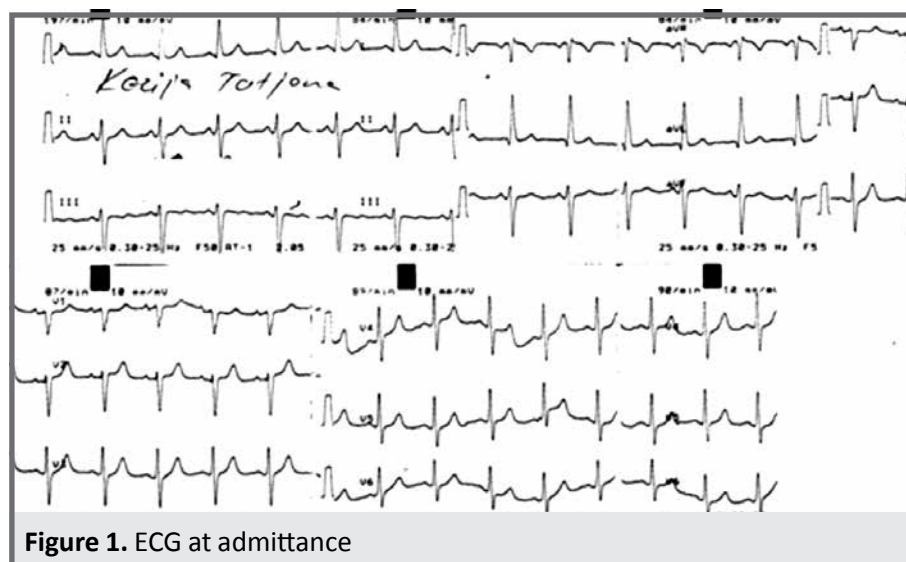


Figure 1. ECG at admittance

Aortocoronary bypass grafting was performed with two venous grafts. (Ao-LAD, Ao-RCA). Patient died after three years because of heart failure.

Discussion

Cardiovascular diseases (after secondary malignancies) are the most important secondary cause of mortality after radiotherapy of lymphoma.³ Pericardium is most often damaged, and it is manifested as acute pericardial effusion. Microvascular damage and high capillary permeability can lead to pericardial adhesions and constrictive pericarditis. Microvascular damage that reduces capillary net as well as macrovascular damage (radiation induced accelerated atherosclerosis), lead to myocardial ischaemia and progressive fibrosis. Incidence of coronary disease is 10.4% - 12.0% and restenosis after percutaneous coronary intervention is 85.7%.⁴ In radioinduced atherosclerosis intimal proliferation of fibrous tissue produces lumen narrowing. Histologically, there is overlap and it is difficult to distinguish radioinduced coronary artery disease. However medial layer is more destroyed and adventitious layer is more thickened and fibrotic in radioinduced heart disease. Patients who already have coronary atherosclerotic disease are particularly vulnerable. Average time interval to coronary disease is 82 months after radiation.

Damage to endothelium of valve leaflets lead to their fibrosis, thickening, and calcification. Incidence of clinically significant valvular disease is 6% - 40% after radiation. Disease is progressive. Lesions induce valvular insufficiency more often than stenosis. Although valves on right side of the heart are closer to chest surface, left heart valves are damaged first, presumably because higher pressures in the systemic circulation.^{5,6} Radiation induced heart disease in patients with lymphoma typi-

cally manifests 15-20 years after treatment and younger patients are more prone to it. Survivors of Hodgkin lymphoma have a four- to seven-fold increased risk of CAD compared with the general population and a cumulative incidence of CVD up to 50% 40 years after treatment. Based on these data, it appears appropriate to screen regularly for cardiac diseases patients who received radiation therapy, starting 10–15 years after the initial cancer treatment and continuing lifelong.¹

References

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