Multiple late cardiovascular complications after combined oncological treatment of Hodgkin’s lymphoma

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Multiple late cardiovascular complications after combined oncological treatment of Hodgkin’s lymphoma

Short title: Radiation-induced late cardiovascular complications

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A 64-years old female with hypertension, dyslipidemia, actively smoking was admitted to the cardiology department due to de novo retrosternal pain (CCS II). In oncological history in 1992, patient was diagnosed with Hodgkin lymphoma (HL) treated with intensive head and chest radiotherapy (cumulative dose, 39 Gy). In 1998 the local relapse was stated and a successful COPP (cyclophosphamide, vincristin, procarbazine, prednison)/ABVD (doxorubicin, bleomycin, vinblastine and dacarbazine) chemotherapy was administered. Physical examination revealed asymmetric pulse and blood pressure difference between the upper limbs (43 mm Hg) with lower pressure, weakness and numbness on the left one. Computed tomography angiography of chest documented inflammatory changes, emphysema, minor nodular lesions without enlarged lymph nodes in the lungs, severe calcification of the aorta, aortic branches, coronary arteries, and aortic valve. The ultrasound Doppler pointed to
non-significant stenosis of left and right internal carotid artery, stenosis of the left subclavian (LSA) and vertebral artery (LVA) with stage III of subclavian steal syndrome. The diagnosis was confirmed in angiography with 70% ostial stenosis of LVA with a highly calcified plaque in LSA with collateral circulation (Figure 1A, B). It was established that angioplasty of lesions was not possible. The surgery of LSA was delayed because of extensive neovascularization around aortic arch and subclavian branches. The transthoracic echocardiography revealed preserved contractility (LVEF 55%), confirmed with global longitudinal strain, with hypokinesia of the basal segments of lateral and inferior walls and moderate tricuspid regurgitation. Moreover, massively calcified aortic valve without significant stenosis was visualized. Furthermore, the post-exercise myocardial perfusion scintigraphy showed perfusion defects in apical and septal segments (11% of myocardium).

Coronary angiography revealed 80% stenosis of left artery descending (LAD) and right coronary artery (RCA) (Figure 1C, D). Results were consulted with Heart Team and the decision about staged primary percutaneous coronary intervention (PCI) was made due to the high risk of potential surgery complications concerning patient history including chest irradiation. In the first step, the LAD angioplasty with the semi-complaint balloon and stent implantation was performed (Figure 1E, F). The PCI of RCA was abandoned due to the extensive calcification and the resolution of symptoms.

Contemporarily, the number of cancer survivors as well as cardiovascular (CV) complications are constantly increasing [1]. In the current report, we present a description of HL survivor with multiple CV side effects, diagnosed almost 30 years after treatment. There are few similar descriptions of such CV complications advancement in the literature [2]. The pathogenesis of these complications is mainly the microvascular destruction and vascular insufficiency caused by radiation induced free radicals generation and endothelial disfunction provided by anticancer agents in diversified molecular mechanism that promote atherosclerosis and CV dysfunction [3]. Summarizing, the discussed patient had high-risk of their occurrence due to high dose of applied non-selective chest radiotherapy (>30 Gy), combination of hematological treatment methods as well as young age during therapy and several CV risk factors [4, 5]. Moreover, the currently recommended ICOS screening intervals, enabling early detection of abnormalities and implementation of adequate preventive methods (Supplementary material, Figure S1) were not applied [5].

**Supplementary material**

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska
Article information

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Figure 1. A, B. 70% ostial stenosis of LVA with significant highly calcified plaque in LSA with collateral circulation; C. significant stenosis of LAD; D. 80% stenosis of RCA; E. LAD during PCI; F. final effect of LAD PCI
Abbreviations: LAD, left anterior descending; LSA, left subclavian artery; LVA, left vertebral artery; PCI, percutaneous coronary intervention; RCA, right coronary artery