Cor et Vasa

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Kasuistika | Case report

Cardiac implantable electronic devices and chemotherapy: A risky combination

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ARTICLE INFO

Article history:
Received: 1. 5. 2017
Received in revised form: 26. 11. 2017
Accepted: 27. 11. 2017
Available online: 17. 1. 2018

Klíčová slova:
Chemoterapie
Implantabilní elektronické přístroje pro léčbu srdečních arytmií
Infekční endokarditida
Kardiostimulátor

Keywords:
Cardiac implantable electronic device
Chemotherapy
Infective endocarditis
Pacemaker

SOUHRN

Incidence infekční endokarditidy není u osob s implantabilními elektronickými přístroji pro léčbu srdečních arytmií nijak výjimečnou komplikací. Běžnými rizikovými faktory pro rozvoj srdeční endokarditidy u pacientů s těmito přístroji jsou diabetes mellitus, chronické onemocnění ledvin, perorální užívání kortikosteroidů, malignity a městnavé srdeční selhání; jistou úlohu v rozvoji této závažné komplikace však může hrát i chemoterapie. Popisujeme případ výše uvedeného typu endokarditidy vyvolané chemoterapií u 64letého muže s četnými rizikovými faktory pro rozvoj srdečního onemocnění.

ABSTRACT

The incidence of infective endocarditis in subjects with cardiac implantable electronic devices (CIEDs) is not an uncommon complication. Diabetes mellitus, chronic kidney disease, oral corticosteroids, malignancies and congestive heart failure represent common risk factors for cardiac device-related endocarditis (CDE); however, chemotherapy (CHT) may also play an important role in this serious complication. We present a case of CHT-induced CDE in a 64-year-old male with multiple cardiac risk factors.

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DOI: 10.1016/j.crvasa.2017.11.009

Please cite this article as: M. Scarano, et al., Cardiac implantable electronic devices and chemotherapy: A risky combination, Cor et Vasa 60 (2018) e469–e471 as published in the online version of *Cor et Vasa available* at https://www.sciencedirect.com/science/article/pii/S0010865017300875

Introduction

The use of cardiac implantable electronic devices (CIEDs) has increased exponentially. Pacemakers (PMKs) are the most commonly used devices and infective endocarditis is considered the most important complication in both early and late onset. Diabetes mellitus, chronic kidney disease, malignancies, oral anticoagulant and corticosteroid use, and congestive heart failure (CHF) are risk factors for cardiac device-related endocarditis (CDE). Chemotherapy (CHT) has also been reported to increase the risk of CDE [1–10].

Case presentation

A 64-year-old man presenting with persistent fever was not responsive to medical therapy. The patient's medical history revealed systemic arterial hypertension treated with antihypertensive drugs for approximately ten years, psoriasis, episodes of atrial fibrillation in treatment with new oral anticoagulant therapy, status post aortic bioprosthetic valve replacement for bicuspid aortic valve-related severe stenosis. He also had a history of myocardial infarction complicated by complete atrioventricular block and consequent pacemaker (PMK) implant in DDD mode with residual moderate left ventricular dysfunction (ejection fraction: 40%). A few years prior to presentation he underwent pharmacological echo-stress for atypical chest pain resulted negative for myocardial ischemia [11–18]. One year before presentation, he was diagnosed with renal cell carcinoma and underwent CHT because of nephrectomy contraindications. Six months before presentation, the patient required the replacement of a depleted generator. The procedure was considered mandatory because the patient was pacemaker-dependent; CHT was suspended for one week prior to the procedure. Upon admission, physical examination revealed signs of PMK pocket infection with catheter externalization (Fig. 1A). ECG monitoring recorded a bicameral PMK-induced rhythm. Trans-thoracic echocardiography was performed; it showed a successful aortic bioprosthetic valve replacement and suspicious images of the right chamber leads. Diagnostic work-up was then completed with trans-esophageal echocardiogram revealing lobular hypo- and hyperechoic fluctuant masses attached to the cardiac leads, consistent with vegetations (Figs.1B and C). Blood culture grew positive for *Staphylococcus aureus*. A targeted antibiotic therapy based on the antibiogram was then administered and electrical leads were surgically removed [19,20].

Discussion

CED is a serious condition associated with a high mortality rate. The increasing rate of CIEDs placement along with the increased number of related procedures performed in patients with multiple comorbidities is responsible for the increased incidence of CIEDs infection and infective endocarditis in this patient population. The incidence of infection involving permanent PMK is extremely variable across studies. A population study reported a CIEDs infection incidence of 1.9 per 1 000 devices/year and a higher risk of infection for permanent PMK versus implantable cardiac defibrillator (ICD). In these patients, both diagnosis and therapeutic strategies are particularly challenging. Several risk factors have been associated with the onset of CIEDs. Patient-related risk factors include renal failure, corticosteroid use, CHF, diabetes mellitus and anticoagulant therapy that may lead to an implant site hematoma after trauma. Procedural features may also play an important role in determining risk; factors associated with a higher risk of infection include type of procedure, number of re-interventions, number of hardware components installed, use of peri-procedural temporary pacing, lack of administration of antimicrobial prophylaxis during perioperative phase, fever onset 24 h prior to the implant and operator experience level. CHT is also mentioned among the factors responsible for a higher risk of infection, likely due to its immunosuppressive effects. In our case we want to underline the CHT role as a risk factor for the onset of CDE. In these patients, additional precautionary measures are necessary, such as the placement of absorbable antibacterial mesh envelope. The antibacterial mesh is impregnated with two highly specific antibiotics that elute off the mesh over the course of a week [2,6,8,9,20,21].

Conflict of interest
None.

Funding body
None.

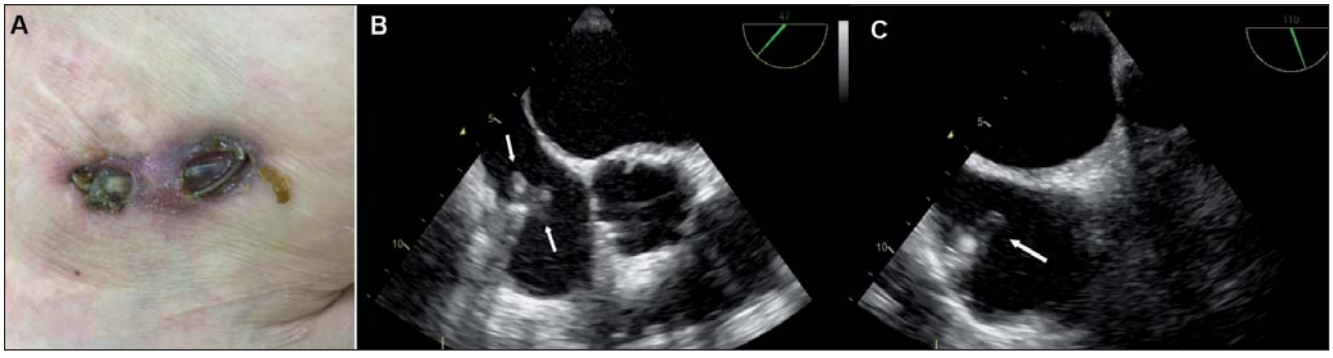

Fig. 1 – (A) Infection of pacemaker's pocket with externalization of the two catheters. (B and C) Transoesophageal echocardiogram confirming the presence of several mobile vegetations adherent to both the leads.

Ethical statement
Authors state that the research was conducted according to ethical standard.

Informed consent
Informed consent was obtained from the patient.

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