

Infective endocarditis associated with artificial iliofemoral vascular prosthesis infection in a patient with caries

Infekcyjne zapalenie wsierdza z towarzyszącym zakażeniem sztucznej protezy naczyniowej biodrowo-udowej u pacjentki z próchnicą zębów

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Abstract

One of the most significant causes of infective endocarditis is a lack of hygiene in the oral cavity. The diversity of the possible clinical course dependent on the primary location of the disease and the extension to other organs require personalised and multidisciplinary treatment. We present 53-year-old patient admitted to the hospital with recurrent fever and left lower extremity pain. Ultrasound of the left groin showed a structure that seemed like a haematoma. Based on positive blood culture and bacterial vegetation on the tricuspid valve shown in echocardiography, infective endocarditis was diagnosed. Antibiotics by antibiogram were enabled with no clinical effect. Additionally, computed tomography of the left groin was performed, which visualised an abscess surrounding a vascular prosthesis implanted 2 years earlier. Four-week antibiotic treatment preceded by replacing the infected prosthesis with a saphenous vein graft was commissioned. Clinical improvement and lowering of C-reactive protein were observed. The presented case is to show the route of therapy for complicated infected endocarditis.

Streszczenie

Infekcyjne bakteryjne zapalenie wsierdza jest chorobą często spotykaną u osób zaniedbujących higienę jamy ustnej. Różnorodność przebiegu klinicznego choroby w zależności od pierwotnej lokalizacji oraz zajęcia innych niż wsierdce organów wymaga indywidualizacji terapii oraz multidyscyplinarnych działań terapeutycznych. Prezentujemy przypadek 53-letniej pacjentki przyjętej do szpitala z powodu nawracających stanów gorączkowych z towarzyszącym bólem całej lewej kończyny dolnej. W wykonanym początkowo badaniu ultrasonograficznym lewej pachwiny stwierdzono zmianę przypominającą wykrzepiony krwiak. Na podstawie dodatknych wyników badań posiewu krwi oraz obecności wegetacji bakteryjnej na zastawce trójdzielnej stwierdzonej w echokardiografii rozpoznano infekcyjne zapalenie wsierdza. Początkowo stosowano antybiotykoterapię wg antybiogramu, jednak bez efektu klinicznego. W dodatkowo wykonanej tomografii komputerowej stwierdzono ropień w okolicy sztucznej protezy naczyniowej implantowanej pacjentce przed 2 laty. Zastosowano 4-tygodniową antybiotykoterapię poprzedzoną wymianą zakażonej protezy na przeszczep z własnej żyły odpiszczelowej i uzyskano poprawę kliniczną oraz redukcję stężenia białka C-reaktywnego. Celem powyższego opracowania było przedstawienie trudności diagnostycznych oraz terapeutycznych wynikających z nietypowo przebiegającego infekcyjnego zapalenia wsierdza.

Introduction

Infective endocarditis often evaluates as a result of bacteraemia induced with bacterial flora of the oral cavity. The course of the disease and its therapy can be complicated by numerous sources of infection. The medical literature describes a lot of cases of infective

endocarditis connected with abscesses of soft tissues or infection of an implanted foreign body (artificial valves, articular prostheses, intravascular catheters). Less attention is given to infections in peripheral artificial vascular prostheses. We present a case of infectious endocarditis accompanied by abscess of soft tissues in the area of an iliofemoral bypass graft.

Case report

A 53-year-old, 154 cm tall, unemployed woman, weighing 43 kg, with coronary artery disease, after ST-elevation myocardial infarction (STEMI) of side wall of the heart 8 months previously, hypertension, and following implantation of a left iliofemoral artificial prosthesis and balloon angioplasty of the right iliac external artery 2 years previously because of atherosclerosis of arteries of lower extremities, with diabetes mellitus type 2 treated with insulin, thyroid inactivity, and smoking habit was admitted to the medical ward because of 5-day recurrent fever up to 39.6°C and escalated pain of the whole left lower limb. The patient could not precisely specify the location of the pain. A few weeks prior the patient was hospitalised because of similar symptoms, but with much lower intensity, accompanied by dysuria symptoms. Urinary tract infection (UTI) was diagnosed. The patient was treated with amoxicillin with clavulanate, with improvement of the medical condition. The patient had taken double antiplatelet therapy since STEMI. She was also chronically treated with bisoprolol, ramipril, atorvastatin, L-thyroxine, and pantoprazole. There was no admitted sexual activity in the last few years. There was no pathology diagnosed in gynaecological examination and ultrasonography. On physical examination there was noticeable but non-painful resistance in the left groin. Murmurs over the heart were not audible. Laboratory serum investigation revealed elevated C-reactive protein (CRP) level – 102.8 mg/l with normal leukocyte, thyroid-stimulating hormone (TSH) 4.46 mU/l, and creatinine 0.85 mg/dl. Urine examination was without infection features. On the basis of an X-ray examination of the chest, pneumonia was excluded. EKG showed no important deviation. Suspecting an infection around the vascular prosthesis in the left groin, a USG was performed, which showed a hypoechoic area situated next to the left common femoral artery, about 3 cm long and up to 9 mm thick – probably coagulated haematoma. Empirically ciprofloxacin with metronidazole was prescribed. After culturing *Staphylococcus aureus* in blood culture, cefuroxime was added. In order to find the original source of infection, a cardiac USG examination was performed, which demonstrated hypoechoic alternation on the anterior lobe of the tricuspid valve. According to DUKE's criteria infective endocarditis was diagnosed [1]. The antibiotic therapy was continued. Despite the initial CRP level reduction to 2.7 mg/l, constant recurrent fever, pain in the left lower limb, and leucocytosis up to 15.2 thousand/ml were observed. Verifying the diagnosis based on the USG, computed tomography (CT) of the abdominal aorta, and iliac and femoral arteries was carried out. It showed a thick liquid in a limited area 16 × 17 mm on the level of the left groin to the anterior surface of the

iliofemoral graft; the position of communication of the common femoral artery with the beginning of the superficial femoral artery and enlarged local lymph nodes. A prosthesis infection was diagnosed. The patient was operated to replace the left PTFE iliofemoral graft with a graft taken from her own saphenous vein; no complications were observed. Afterwards the patient was moved again to the Internal Disease Department to continue antibiotic therapy. During the next 4 weeks gentamycin was applied under the control of kidney parameters [1]. During the first period of treatment blood glucose was unstable, with diurnal glucose fluctuations between 68 and 316 mg/dl on Humulin R 20 units per day and Humulin N 6 units per day in a four-injection scheme. The noticeable improvement of blood glucose control was observed after progression of infective endocarditis treatment and modification of insulin treatment. The patient received Actrapid and Insulatard, and the dose of long-acting insulin was increased to 12 units per day, with blood glucose varying between 87 and 276 mg/dl within 24 h. Furthermore, 1000 mg of metformin per day was administered. Before being discharged the CRP level was 0.9 mg/l, and creatinine level and white blood cell count were within the normal range in laboratory tests. The TSH was 5.97 with the FT4 level within normal range and no symptoms of hypothyroidism. In control heart ECHO the hypoechoic transformation was still visible, but without progression. Due to temporary increases in blood pressure 5 mg of amlodipine per day was added to the therapy, with good clinical outcome. At the beginning and at the end of treatment, and during the perioperative period, her body weight maintained the same level. The patient was discharged home with the recommendation of sanitation of her oral cavity with antibiotic protection at home. Further diagnostics by a dentist, including a culture of the oral cavity, was suggested.

Discussion

The epidemiology of infective endocarditis is hard to estimate because of many difficulties in correct diagnosis (only 20% of cases are diagnosed correctly). The incidence of infective endocarditis in the United States is 1 case per 1000 hospitalised patients. Males are more likely to develop infective endocarditis than women (1.7 : 1). Nearly 90% of infective endocarditis pathogens are *Staphylococcus*, *Streptococcus*, and *Enterococcus* sp. Infections caused by *Streptococcus* are more often seen in non-drug addicted patients and in those who have no hospitalisation episodes in their past. Nowadays, because of the increasing number of frequent hospitalisations and surgical interventions using artificial materials taking place all over the world, it is apparent that *Staphylococcus aureus* is the main infectious agent [2]. This pathogen is related with high mortality (25–47%) [3]. Recently, most in-

fective endocarditis has been seen to be located in the left side of the heart. Those are located in the right side of the heart are mainly caused by *Staphylococcus aureus* (60%) [4, 5]. Following studies during the last 5 years, it has been shown that the main risk factor of right side endocarditis is artificial material placed in the body, such as vascular catheters, prosthetic implants, vascular prosthesis, and intracardiac devices, such as implantable cardioverter defibrillators [5]. Another important risk factor is inadequate oral hygiene.

Gingivostomatitis is connected with inflammation of surrounding tissues, which enables bacteria biofilm to spread from plaque into the blood stream. Bacteraemia can lead to internal organ infection, often creating multiple abscesses [6]. Patients with artificial implants are highly predisposed to developing abscesses in the surrounding tissues.

Primary infection of the artificial vascular prosthesis is a relatively frequent complication. For aorto-bifemoral bypass transplant this amounts to 0.5–3% of all operations, most of which developed within 4 months after surgery (early infections) [7, 8]. Taking into account the fact that the surgery of our patient took place 2 years before infective endocarditis, it is more likely that caries and oral inflammation are responsible for the infection.

Early diagnosis is essential to avoid serious complications of infective endocarditis. The choice of correct treatment is a very important factor. Regarding the presented case, its description can be useful for the treatment of other patients with artificial materials in the body and suspicion of infective endocarditis.

The positive blood culture and the oscillating intracardiac mass on the valve visualised in echocardiography helped to give a proper diagnosis and the correct treatment. Delayed radiological verification of the bypass infection made the diagnostics more difficult and resulted in ineffective antibiotic therapy. If the CT of the bypass and surrounding tissues took place earlier, it would have visualised the pathology earlier than the occurrence of clinical symptoms. This would have meant that the infected bypass could have been replaced earlier. Because haemodialysis therapy is important for the development of infective endocarditis, patients undergoing haemodialysis through artificial arteriovenous fistula are particularly vulnerable to infection in the creation of vascular access [7].

According to the presented case, it is worth considering the CT of a shunt's surrounding tissues as a routine test among patients with infective endocarditis, even when ultrasonography shows a pathology that is not sufficiently precise to make a proper diagnosis.

Conflict of interest

The authors declare no conflict of interest.

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