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Kasuistika | Case report

Unusually extensive and diverse case of infective endocarditis

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SOUHRN

Prezentujeme zde případ 74letého muže, který byl indikován k plánované náhradě aortální chlopně (AVR) pro suspektní infekční endokarditidu těžce stenotické aortální chlopně. Hemokultury prokázaly *Enterococcus faecalis* a *Klebsiella pneumoniae* (ESBL+). Logistické Euroscore bylo 9,11 % a skóre STS (Society of Thoracic Surgeons) pro mortalitu při izolované AVR 2,539 % a pro mortalitu a morbiditu 21,784 %. Náhrada aortální chlopně byla provedena přístupem z minithorakotomie a byla implantována protéza ESP 100-21mm SJM. Desátý den po výkonu se objevily teploty a došlo opět k leukocytóze a elevaci CRP. Další průběh onemocnění byl přes veškeré snahy nepříznivý a fatální.

ABSTRACT

We present the case of a 74-year-old man originally scheduled for planned surgical aortic valve replacement due to suspected infective endocarditis on a severely stenotic valve. Blood cultures revealed *Enterococcus faecalis* and *Klebsiella pneumoniae* (ESBL+). Logistic Euroscore was 9.11% and STS for isolated AV replacement (AVR) showed mortality risk 2.539% and 21.784% morbidity or mortality risk, respectively. AVR procedure was performed with mini-thoracotomy approach, ESP 100-21mm SJM prosthesis was implanted. On the 10th day following the procedure fever spikes with CRP and WBC elevation reoccurred and further course of the disease with all its capabilities was rather unfortunate and ended up fatally.

Introduction

We present the case of a 74-year-old man originally scheduled for planned surgical aortic valve replacement due to suspected infective endocarditis on a severely stenotic valve.

Infective endocarditis remains a challenge both to diagnose and to treat. Positive results depend on a rapid diagnosis, accurate stratification of the risk and a meticulous follow-up.

Our patient was originally a rather typical case of infective endocarditis planned for treatment with valve replacement as recommended in the European Society of Cardiology 2009 Guidelines. Unfortunately further course of the disease with all its capabilities was rather unfortunate and ended up fatally.

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Case report

A 74-year-old white male (with history of hypertension and previously diagnosed severe aortic stenosis) scheduled for planned surgical valve replacement was admitted to the Department of Noninvasive Cardiology and Hypertension due to suspected infective endocarditis. Patient presented with fever (maximum of 38.5 degrees Celsius), general fatigue, weight loss of 3 kg (in 3 weeks), lack of appetite, increasing dyspnea (New York Heart Association Class III), signs of upper respiratory tract infection. During physical examination at admission additionally apart from fever (38 degrees Celsius), tachycardia (112 heart beats per minute), signs of increased adrenergic activity, i.e., sweatness and dyspnea at rest were revealed. Elective coronary angiography performed a month before admission showed no signs of coronary artery disease. Transesophageal echocardiography (TEE) revealed vegetation on left and right aortic cusps (left ventricle ejection fraction [LVEF] 60%, peak/mean gradient 94/45 mmHg, aortic valve area [AVA] 0.97 cm^2, no aortic regurgitation [AI]). Laboratory data at admission revealed: white blood count (WBC) 16.69 thousands/mL (norm 4.5–10.0 thousands/mL), neutrophiles (NEU) 14.07 thousands/mL (norm 1.90–7.00 thousands/mL), % of neutrophiles 84.3% (norm 40.0–68.00 %), fibrinogen 196 mg/dl (norm 200–393 mg/dl), C-reactive protein (CRP) was not performed. Blood cultures revealed *Enterococcus faecalis* and *Klebsiella pneumoniae* (ESBL+). First 6 bottles after incubation detailed analysis showed: bottle (1) – *Enterococcus faecalis* ESBL (–), HLAR (–), VRE (–) (ampicillin-sensitive (S), gentamicin-resistant (R), streptomycin-R, vancomycin-S, teicoplanin-S), bottle (2), (3) and (4) – were exact same as bottle (1), bottle (5) and (6) were negative. Second 6 bottles after incubation detailed analysis showed: bottle (1) and (2) exact as results mentioned above with *Enterococcus feacalis*, bottle (3) and (4) were negative and bottle (5) and (6) – *Klebsiella pneumoniae* ESBL(+), sensitive only for imipenem, meropenem and ertapenem. Previously implemented empiric antibiotics (cefazoline 1 g bid) were modified (after detailed analysis with Head of the Microbiology Department ciprofloxacin 200 mg bid with amicacin 1 g bid were introduced for 7 days) with no significant medical improvement. Again after detailed analysis with Head of the Microbiology Department ciprofloxacin was stopped, amicacin 1 g bid was continued and amixicilin with clavulonic acid 1.2 g tid and metronidazol 500 mg bid were added, this regimen was continued for 15 days. During following days patient stabilized, inflammatory parameters dropped (including WBC, CRP and NEU). Logistic Euroscore was 9.11% and STS for isolated AV replacement (AVR) showed mortality risk 2.539% and 21.784% morbidity or mortality risk, respectively. AVR procedure was performed with mini-thoracotomy approach, ESP 100-21mm SJM prosthesis was implanted. On the 10th day following the procedure fever spikes with CRP and WBC elevation reoccurred. Blood culture revealed the same bacterial species (*Enterococcus faecalis* and *Klebsiella pneumoniae* ESBL (+)). Subsequent modification of pharmacotherapy was applied, again after detailed analysis with Head of the Microbiology Department amicacin 1 g bid and metronidazol 500 mg bid were stopped, amixicilin with clavulonic acid 1.2 g tid was continued and vancomycine 1 g bid was added – for 4 days without significant influence on the disease. After 4 days another change was made, vancomycine 1 g bid was continued and meronem 2 g bid. Following transthoracic echocardiographs (TTE) and TEE showed progressive signs of infective endocarditis on the replaced valve with extensive vegetations (Fig. 1A), abscesses (Fig. 1B), with dysfunction of prosthesis (including excessive movement with possible extraction (Fig. 1C), and signs of severe perivalvular leak. Within couple of days, despite complex and intense antibiotics therapy, vegetations within right atrium and mitro-aortic continuum infective infiltrations were detected. Due to medical condition surgical aortic and mitral valve replacement (SJM mechanical valves) with extraction of visible

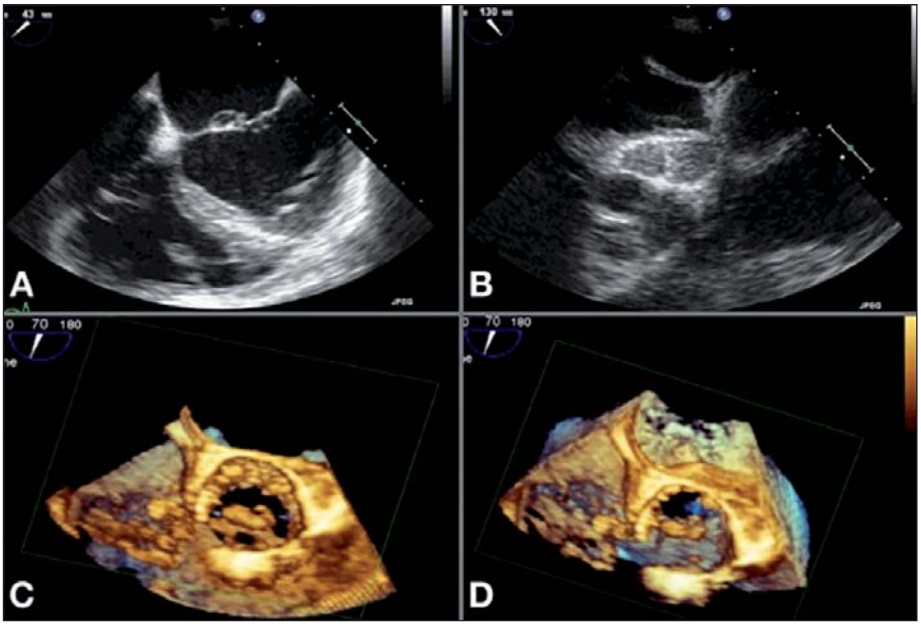

Fig. 1. – (A) Vegetation attached to the mitral valve leaflet (TEE), (B) possible periannular multiple abscesses (TTE), (C) aortic annulus disembowelment (TEE, 3D reconstruction), (D) multiple infective endocarditis complications in one patient (TEE, 3D reconstruction).

vegetations were performed with acceptable results of the procedure. Unfortunately, despite unusual actions applied, patient died on the third day following surgery. Presented case shows unfortunate outcome of infective endocarditis (primarily of the native AV) with the progressive nature of the infectious process (despite optimal pharmacological therapy and heroic surgical interventions), which resulted in almost all the complications mentioned in the literature in a single patient (Fig. 1D).

Discussion

Surgical treatment of infective endocarditis due to severe complications is performed in about 50% of patients [1]. Surgical treatment in the acute phase of the disease is considered in order to avoid progressing heart failure, irreversible structural damage due to severe infection and in order to avoid systemic emboli [2]. On the other hand, surgical treatment brings significant risk. In some cases Guidelines recommend immediate surgery (in less than 24 hours) or urgent surgery (within couple of days) regardless of the length of the antibiotic treatment. In other cases surgery can be slightly delayed. As mentioned three main indications for surgery are heart failure, uncontrolled infection and avoidance of the systemic emboli. Taking all that under consideration decision in our case to proceed with the planned operation seemed right and balanced.

Unfortunately, couple of days after the first operation severe infection reoccurred, blood culture revealed the same bacterial species and as mentioned subsequent modification of pharmacotherapy did not have significant influence on the disease course and patient rapidly deteriorated. What is more we had, at that time, an infective endocarditis not on a native, but on a prosthetic valve. There are several risk factors connected with worse prognosis in infective endocarditis and endocarditis on a prosthetic valve is one of them. Among others we have:

- periannular complications (regardless of the mitral or aortic annulus),
- severe aortic or mitral insufficiency,
- large vegetations,
- severe dysfunction of the prosthetic valve.

Then taking under consideration all that and all what Guidelines had to offer decision about immediate surgery with an attempt to remove all the visible infection sites, even though we knew it was an enormously high risk patient, seemed the only reasonable option. The incidence of surgical treatment of infective endocarditis has recently increased significantly, since the rate of surgical treatment for multiple valve involvement is almost 70% [1,3]. Many authors have reported on the surgical outcomes of multiple valve infective endocarditis [4,5]. Mueller et al. reported in 25 consecutive patients who underwent surgery for infective endocarditis (mean follow-up 4.7 years) 28% valve-related complications: five bleedings (one died), one embolic event and one prosthetic valve thrombosis [4]. Mihaljevic et al. showed in 63 patients who underwent multivalve surgical procedures for infective endocarditis early mortality of 16%. Out of 53 patients discharged from the hospital 87 ± 4% were alive at 5 years and 64 ± 9% at 10 years [5]. Musci et al. described 255 patients who received Shelhigh bioprosthesis between 2000 and 2007, 74.1% had native and 25.9% had prosthetic acute infective endocarditis. There was a highly significant difference in survival rate between patients who were operated on urgently versus in an emergency ($p < 0.0001$), between single and double valve replacement ($p = 0.0206$) and between patients with and without abscess formation ($p = 0.0245$) [6]. Prosthetic valve endocarditis differs from native valve endocarditis and it has a more difficult diagnosis and surgical strategy, frequently worse prognosis [7]. And apparently, even though we used all the current knowledge, made balanced and well thought decisions, coming across a very high risk patient with almost all the complications mentioned in the literature in a single person, the disease was smarter and the result was fatal.

Conclusions

Infective endocarditis is usually considered as a multifaceted problem, from etiology and presentation to diagnosis and management. It is pretty well researched and doctors are well armed with all different diagnostic and treatment methods. Despite all that, we still have a lot to learn and a lot to research when it comes to especially early detection, possibly with different imaging modalities.

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Ethical statement
Not applicable.

Conflict of interest
The authors have no commercial associations or sources of support that might pose a conflict of interest.

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