CASE REPORT

Right-sided infective endocarditis presenting with purpuric skin rash and cardiac failure in a patient without fever

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SUMMARY

We describe the case of a 70-year-old woman who presented with symptoms of cardiac failure, and was found on clinical examination to have a purpuric rash over her lower extremities. Further evaluation of cardiac failure revealed tricuspid regurgitation with two large tricuspid valve vegetations. Blood cultures yielded a growth of *Streptococcus viridans*. She was treated with an intravenous ceftriaxone and gentamicin and made a complete recovery with resolution of the rash.

BACKGROUND

Tricuspid valve endocarditis is a form of right-sided endocarditis, and therefore displays three characteristic features that distinguish it from left-sided endocarditis. First, unlike left-sided endocarditis that can occur in patients without obvious risk factors, tricuspid valve endocarditis typically occurs in patients with predisposing factors such as intravenous drug abuse, presence of intracardiac devices such as a pacemaker or implantable defibrillator, and congenital malformation of the tricuspid valve.¹ Indeed a Spanish study found only 17 cases (2.9%) of right-sided endocarditis without predisposing factors, out of 583 consecutive cases of infective endocarditis.² Second, right-sided endocarditis is not associated with the peripheral stigmata seen in left-sided endocarditis such as splinter haemorrhages and skin rashes,¹ as septic emboli are trapped within the pulmonary circulation. Instead, these patients present with persistent fever associated with recurrent pulmonary events, anaemia and microscopic haematuria—a condition termed as the ‘tricuspid syndrome’.³ Third, right-sided endocarditis is usually associated with microorganisms colonising the skin or intravascular catheters such as coagulase-negative staphylococci, *Staphylococcus aureus* and *Candida albicans*.²

Our patient displayed none of these features; there were no risk factors for right-sided endocarditis, peripheral stigma in the form of a purpuric rash was seen, and the organism responsible was *Streptococcus viridans*—an organism associated more often with left-sided infective endocarditis. Most importantly, she never developed fever, a cardinal manifestation of infective endocarditis seen in up to 96% of patients with infective endocarditis.⁴ Indeed, the only suggestive clinical finding in our patient was the presence of cardiac failure.

This case report highlights an atypical presentation of infective endocarditis. A high index of

suspicion should be maintained for infective endocarditis in patients with unexplained cardiac failure with peripheral stigmata of endocarditis even in the absence of fever and predisposing risk factors.

CASE PRESENTATION

A 70-year-old woman presented with anorexia and easy fatigability for the past 3 months and painless swelling of both feet for the past 1 month. She denied any associated symptoms of fever, cough or chest pain. There was no significant medical history. Specifically, there was no history of cardiac illness in the past. She also denied any history of substance abuse. Physical examination showed mild conjunctival pallor, bilateral pitting ankle oedema and a non-blanching, non-pruritic purpuric rash over the anterior aspect of both legs (figure 1). The patient was haemodynamically stable. Jugular venous pressure was elevated to 6 cm above the sternal angle with a prominent v wave. Cardiac auscultation revealed a grade 3/6 pansystolic murmur in the tricuspid area, which increased with inspiration. The second heart sound was narrowly split with a loud pulmonic component. A third heart sound was not audible.

INVESTIGATIONS

Routine laboratory tests confirmed the presence of anaemia (Haemoglobin: 10.9 g/dl). Mild leucocytosis was also noted (total leucocyte count: $11.9 \times 10^9/l$). Erythrocyte sedimentation rate was normal (8 mm/h). Other parameters including

Figure 1 Non-blanching purpuric rash seen over anterior aspects of both legs.

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Figure 2 Transthoracic two-dimensional echocardiography (apical four-chamber view) in diastole (left) and systole (right) showing vegetations (arrow) on tricuspid valve. RA, right atrium; RV, right ventricle; LA, left atrium; LV, left ventricle.

serum electrolytes, renal and liver function tests were essentially normal. Antinuclear antibodies and antineutrophil cytoplasm antibodies (ANCA) were negative. Electrocardiography revealed sinus tachycardia.

Chest x-ray was normal. Transthoracic echocardiography was performed for evaluation of heart failure. It showed severe tricuspid regurgitation (figure 2), with two large tricuspid valve vegetations measuring 3 cm×2.5 cm and 2×1.5 cm, respectively, on the anterior and septal leaflets (figure 3). Mild dilatation of the right atrium and ventricle was noted. The inferior vena cava was dilated (1.9 cm) with decreased respiratory variation. Moderate pulmonary arterial hypertension was present

with an estimated right ventricular systolic pressure of 50 mm Hg.

Abdominal ultrasonography revealed mild hepatomegaly but was otherwise normal.

Three blood cultures were then drawn aseptically from three separate sites, 1 h apart. *S viridans* was isolated from all three samples.

DIFFERENTIAL DIAGNOSIS

- ▶ Tricuspid valve endocarditis due to *S viridans* with tricuspid regurgitation and right heart failure.

TREATMENT

Antibiotic therapy with parenteral ceftriaxone (2 g intravenous q24h) and gentamicin (60 mg intravenous q8h) was commenced pending blood culture reports. After isolation of *S viridans* from all three cultures, ceftriaxone was continued for 4 weeks and gentamicin for 2 weeks.

Symptomatic treatment for heart failure with diuretics and digoxin was also administered.

OUTCOME AND FOLLOW-UP

The patient made a good recovery from heart failure with complete resolution of peripheral oedema and elevated jugular venous pressure. The purpuric rash also disappeared with antibiotic therapy. Blood cultures repeated after 2 weeks were sterile. Three months after the index illness, the patient remains on regular follow-up at our hospital, with no recurrence of symptoms. Echocardiography on follow-up showed a significant reduction in the size of the vegetations and mild tricuspid regurgitation.

DISCUSSION

Infective endocarditis is known to present with a wide variety of symptoms, both cardiac and non-cardiac. Although cardiac symptoms arising from valvular regurgitation, leaflet perforation and prosthetic valve dehiscence can indicate severe and life-threatening illness, they are often the characteristic peripheral signs of infective endocarditis that alert the treating physician to the possibility of underlying endocarditis. A large number of peripheral signs have been described by several physicians for whom some signs are eponymously named; it is important to note, though, that these signs are inconstant and usually absent altogether in right-sided endocarditis. Indeed, a large multi-

Figure 3 Transthoracic apical four chamber view with colour Doppler showing tricuspid valve regurgitation. TR, tricuspid regurgitation; RA, right atrium; RV, right ventricle; LA, left atrium; LV, left ventricle.

centre prospective study on all forms of infective endocarditis found only fever to be a constant feature, with the incidence of other signs ranging from 48% for a new murmur, to 2% for Roth's spots.⁴ Similarly, studies in right-sided endocarditis show fever as the dominant symptom with associated symptomatology arising from septic pulmonary emboli including pleuritic chest pain, dyspnoea and haemoptysis.⁵ Therefore, the absence of fever in our case was notably atypical.

A similar case of native tricuspid valve endocarditis with skin rash was reported by Wilczynska *et al*⁶ in an elderly Caucasian man with no history of intravenous drug use. In that instance, the patient tested positive for antiproteinase-3 antibody at high titres. Although a skin biopsy showed no evidence of leucocytoclastic vasculitis, the rash was considered vasculitic in etiology. The description of the rash itself closely matched the rash seen in our patient; unfortunately, the patient refused a skin biopsy. Nevertheless, the ready response to antibiotic therapy was a strong indication that the rash was a peripheral manifestation of endocarditis. However, in contrast to the previous case, ANCA antibodies were negative. Moreover, the patient described by Wilczynska *et al* developed a fever, which was altogether absent in our patient. Therefore, we believe our case to be an even more unusual presentation of tricuspid valve endocarditis.

Competing interests None.

Patient consent Obtained.

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Learning points

- ▶ A high index of suspicion should be maintained for infective endocarditis in patients with unexplained cardiac failure with peripheral stigmata of endocarditis.
- ▶ The absence of fever cannot be used to conclusively rule out infective endocarditis if other clinical signs are present.
- ▶ Blood cultures and transthoracic echocardiographic imaging are safe and non-invasive techniques that can readily confirm or rule out infective endocarditis in patients with atypical presentations.

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