CASE REPORT

Keeping track of migratory pulmonary lesions

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SUMMARY

Tricuspid valve endocarditis (TVE) is rarely considered in the differential diagnosis of a febrile patient who does not use intravenous drugs. We describe the case of a 62-year-old male patient with a 3-month history of remittent fever and 13% weight loss. The patient denied intravenous drugs use or recent invasive procedures. His medical history included type 2 diabetes, alcohol abuse and smoking. Clinical evaluation revealed systemic inflammatory syndrome with unremarkable physical examination. Ancillary tests showed leucocytosis, thrombocytopenia and elevated C reactive protein. Empiric intravenous ceftriaxone was started, but after an initial improvement, fever relapsed 2 days after stopping antibiotherapy. A CT scan showed multiple disseminated lesions, suggesting lung metastatic tumour. Further studies excluded malignancy and revealed TVE caused by *Streptococcus bovis* with pulmonary embolism. The aim of our study is to stress the importance of evoking TVE in the differential diagnosis of fever with lung manifestations, and to highlight the possible association between *S bovis*, colorectal cancer and liver disease.

BACKGROUND

Right-sided infective endocarditis (IE) occurs mainly in intravenous drug users, in patients with cardiac devices implanted and in those with central venous lines or with congenital heart disease.¹ Tricuspid valve endocarditis (TVE) is rarely considered in the differential diagnosis of a febrile patient who does not have those risk factors. This type of endocarditis can evolve with fever and pulmonary symptoms or signs, mimicking other illnesses, namely malignancy.

Streptococcus bovis endocarditis has been associated with colorectal cancer and liver disease.

CASE PRESENTATION

A 62-year-old Portuguese Caucasian man was referred to the emergency department for a 3-month history of remittent fever ($T_{\max}$ 39.5°C), hyperglycaemia, 13% weight loss without anorexia and transient periods of obnubilation/confusion. No suggestive epidemiological context was identified, at that moment.

He had a medical history of type 2 diabetes, arterial hypertension, alcohol abuse (abstinent for the last 3 months) and he was also an ex-smoker (30 pack-years, stopped 40 years ago). The patient denied intravenous drug abuse or any recently invasive treatment or diagnostic procedures. He was chronically treated with losartan 50 mg once a day (qd), metformin/vildagliptin 1000/50 mg twice

daily, gliclazide 60 mg (qd), propranolol 40 mg (qd) and folic acid 5 mg (qd).

At the time of admission, the patient was febrile (37.8°C), dehydrated, tachypnoeic (20 cycles/min), hypotensive (72–56 mm Hg), tachycardic (115 bpm), with peripheral oxygen saturation of 93% and pale. Cardiopulmonary examination was unremarkable. Signs of chronic alcohol abuse were present. The remaining physical examination, including neurological evaluation, was normal.

Ancillary tests revealed normochromic normocytic anaemia (9.4 g/dL; normal range (NR) 13–17.5), mild leucocytosis (10 900/μL; NR 4000–10 000), neutrophils 9650/μL; NR 2000–7000), thrombocytopenia (123 000/mm³; NR 150 000–400 000), high C reactive protein (7.2 mg/dL; NR <1.0), high procalcitonin levels (29.94 ng/mL—high risk), erythrocyte sedimentation rate of 93 mm in the first hour (NR <14), low albumin (31 g/L; NR 35–50) and normal renal function, blood ions and hepatic transaminases. On blood gas analysis, he presented respiratory alkalosis (pH 7.55; partial pressure of carbon dioxide 30 mm Hg; HCO₃⁻ 26 mmol/L) and lactacidemia of 2.0. Urinalysis was normal. Electrocardiogram showed sinus tachycardia (105 bpm). Chest X-ray and abdominal echography had no abnormalities. Cerebrospinal fluid (CSF) revealed glucose level of 7.5 mmol/L (NR 2.2–4.1), proteins of 112.4 mg/dL (NR 12–60) and 5 mononuclear cells/mm³. Cerebral CT and MRI excluded an encephalitic condition.

Even considering the lack of a clear focus justifying the systemic inflammatory syndrome, empiric intravenous antibiotherapy was started with ceftriaxone 2000 mg/day. However, the patient evolved with septic shock and dopamine was started in the first couple of hours.

Improvement was observed after 2 days of treatment, with no fever and decreasing inflammatory markers, and he completed 8 days of ceftriaxone. However, 2 days after stopping the treatment, fever relapsed.

Further investigation revealed negative CSF microbiology (aerobics and virus), negative viral and bacterial serologies, negative syphilis screening, negative Mantoux test, negative autoimmune study (antinuclear antibodies, extractable nuclear antigens, anticardiolipin and anti-β₂-glycoprotein 1) and normal thyroid function tests.

Thoracic, abdominal and pelvic CT scan found multiple thoracic nodular lesions, suggestive of metastatic tumours (figure 1A–E), a diffusely heterogeneous liver parenchyma, with preservation of normal vascular architecture, compatible with infiltrative process or normal areas of parenchyma in a

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Figure 1 Two CT scans, sparse by one month, at different thoracic levels, showing multiple nodular bilateral lung lesions, resembling metastatic tumours. Images (A–E) (February 2011): lesions (arrow); Images (F–J) (March 2011) (acquisition performed in ventral decubitus with posterior rotation) vanishing of old lesions (F–H, J) and new ones (I; arrow).

steatotic liver and distal small bowel wall thickening. Upper gastrointestinal endoscopy showed grade 1 oesophageal varices and chronic gastritis. Colonoscopy with ileoscopy showed a normal mucosa. MR enterocolonography and tumour markers were normal.

A thoracic percutaneous CT-guided biopsy was scheduled, but when programming the intervention, the lesions were less and they had a different location (figure 1F–J).

Although the clinical suspicion for IE was low, a transoesophageal echocardiogram was performed, which disclosed tricuspid valve vegetation measuring 13×11 mm (figure 2). Two blood cultures were positive for *S bovis*. A definitive diagnosis of TVE with septic pulmonary emboli was performed. Intravenous antibiotherapy guided by the antibiogram was started with penicillin and gentamicin, which showed fever remission in 2 days. The patient completed 28 days of penicillin and 14 days of gentamicin. Control echocardiographic

Figure 2 Transoesophageal echocardiography showing tricuspid valve vegetation measuring 13×11 mm (arrow). AoV, aortic valve; LA, left atrium; RA, right atrium; RV, right ventricle; TV, tricuspid valve.

examination showed mild tricuspid regurgitation and no vegetations. Control blood cultures were also negative.

After this successful intervention, the patient was discharged.

TREATMENT

Penicillin G 12 million units/24 h intravenously into four doses for 4 weeks plus gentamicin 3 mg/kg/24 h intravenously into three doses for 2 weeks.

OUTCOME AND FOLLOW-UP

After 2 years of follow-up, the patient is asymptomatic, with echocardiogram showing normal right ventricle function and mild-to-moderate tricuspid regurgitation. He maintains regular follow-up at cardiology and hepatology outpatient clinics.

DISCUSSION

IE is still associated with high in-hospital mortality, ranging from 16% to 25%,^{2–5} despite improvement in diagnostic and therapeutic strategies and is associated with a high incidence of embolic events, ranging from 13% to 49%.⁶ In a recent review, the mean age of patients with IE varied between 36 and 69 years, the median incidence of disease was 3.6/100 000/year (increasing with age) and the male-to-female ratio was about 2:1.⁵ Right-sided IE accounts for 5–10% of the cases.⁷

Some authors suggest that clinical suspicion of TVE should be raised in the presence of recurrent pulmonary events, anaemia and microscopic haematuria—the so-called tricuspid syndrome.¹ Some patients, such as ours, present with constitutional features, namely debility, anaemia and weight loss, evoking a diagnostic work-up for tuberculosis and malignancy. This investigation caused a delay in the correct diagnosis.

In the present case report, blood cultures were positive for *S bovis*. This is a species of Gram-positive lactic acid bacterium that in humans is associated with endocarditis in elderly populations,⁸ inflammatory bowel diseases and colorectal cancer.⁹ Other sporadic reports have also suggested the possible association of *S bovis* endocarditis with liver disease such as hepatitis C virus/hepatitis B virus chronic hepatitis or cirrhosis and ethanol abuse.^{10 11}

S bovis and *Staphylococcus aureus* have been associated with an increased embolic risk,^{12 13} such as large vegetations >10 mm and/or severe vegetation mobility.¹⁴

Valvular surgery should be considered in patients with right heart failure secondary to tricuspid regurgitation with poor response to diuretic therapy, TVE caused by organisms which are difficult to eradicate, large mobile vegetations (>20 mm) or recurrent embolic events.⁷

Our case is an example of IE by *S bovis* on native tricuspid valve in an adult man with previous hepatic illness (alcohol abuse, persistent thrombocytopenia, diffusely heterogeneous liver parenchyma and oesophageal varices), associated with pulmonary embolism due to a large vegetation (13 mm). There was no need for valvular surgery, once there was improvement under medical therapy. The association with valvular regurgitation has been described in the literature.¹⁵ Tuberculosis and colorectal cancer were discarded.

The long-term prognosis for this patient depends on the valvular disease evolution.

Learning points

- ▶ Tricuspid valve endocarditis can mimic a chronic illness complicated with pulmonary events, anaemia and microscopic haematuria.
- ▶ *Streptococcus bovis* has been associated with an increased embolic risk.
- ▶ Malignant gastrointestinal tumours must be ruled out after *S bovis* infective endocarditis.

Contributors All authors were directly involved in this clinical case. IMP selected and managed the case study, carried out the literature review and led the writing of the manuscript. FC performed the serial echocardiographic assessment of the

patient. JCQ carried out the patient's follow-up. DM selected and managed the case study and reviewed the intellectual content of the manuscript.

Competing interests None.

Patient consent Obtained.

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