Author's response to reviews

Title: Group B Streptococcus Tricuspid Endocarditis Presenting with Joint Pain in a 30 year-old Post-partum Woman - A case report

Authors:

Paul Vincent (paolodivincenzi@doctors.org.uk)
Russell Davis (russell.davis@swbh.nhs.uk)
Debashis Roy (debashisroy@hotmail.com)

Version: 3 Date: 23 April 2012

Author's response to reviews: see over
Group B Streptococcus tricuspid endocarditis presenting with joint pain in a 30-year-old post-partum woman: a case report

Paul Vincent¹*, Russell Davis², Debashis Roy²

¹56 Kingsbury Road, Erdington, Birmingham, B24 8QJ
²Sandwell General Hospital, Lyndon West Bromwich West Midlands B71 4HJ

E-mail addresses:
*Paul Vincent - paolodivincenzi@doctors.org.uk
Russell Davis - russell.davis@swbh.nhs.uk
Debashis Roy - debashisroy@hotmail.com

*Corresponding author
Abstract

Introduction – Infective endocarditis presenting with arthralgia is rare. Group B Streptococcus tricuspid endocarditis as a post-partum complication is even rarer. The present case is an example of both.

Case Presentation – A 30-year-old Caucasian woman presented with painful swelling of the wrists and ankles.

Conclusion – Even when the clinical presentation of systemic inflammation is more suggestive of a primary rheumatological disorder, it is important to remember that bacterial infection can also present in this manner. Group B Streptococcus tricuspid valve endocarditis is a rare, but recognised, post-partum complication.

Keywords – infective endocarditis, tricuspid, SLE mimic, polyarthritis, post-partum, Group B Streptococcus
Introduction

Many diseases feature multi-system involvement. Diagnosing these diseases correctly is challenging enough. However, a particular conundrum occurs when the atypical presentation of one condition happens to fit the diagnostic criteria for a different condition. If the two conditions have completely different managements, it becomes a matter of life and death. Such a case is described here.

Case Presentation

A 30-year-old Caucasian woman presented to Accident and Emergency with immobility due to back pain. She reported a 10-day history of lumbar back pain, which started 3 days after giving birth. The pain was worse with movement and radiated down her legs. After 7 days, the pain spread to involve her wrists, elbows, knees, and ankles.

The patient’s past medical history included only recent childbirth. Two weeks previously, she had given birth at 40 weeks to a healthy baby boy. Other than some light bleeding in the first trimester, there had been no antenatal symptoms or abnormalities on routine blood work or scans. There was no history of unexplained fever, sweats, vaginal discharge, or pelvic tenderness. Delivery was unremarkable other than having required episiotomy just before delivery because of a second-degree tear. One day after delivery, the patient had complained of dysuria and was treated with trimethoprim for a urinary tract infection. The infant had not required hospitalisation after delivery. He was fit and well at the time of our patient’s admission. There was no previous or family history of any autoimmune conditions, specifically primary arthropathies.
Initial observations revealed mild tachycardia only (heart rate, 107 bpm). No fever was detected. Clinical examination revealed warm, red, swollen wrists, forearms and shins and stiff elbows, ankles, and knees with restricted ranges of motion. Heart sounds I and II were present with no additional sounds. Breath sounds were normal and vesicular without any crepitations or bronchial breathing. Abdominal examination was unremarkable. Vaginal examination revealed a mildly tender cervix, but no vaginal discharge.

Results of initial investigations included platelets of $13 \times 10^9$/$L$ ($150–450 \times 10^9$/L), C-reactive protein of 312 mg/L (<5 mg/L), albumin of 22 g/L (35–50 g/L), urea of 20 mmol/L (2.5–6.7 mmol/L), and creatinine of 100 µmol/L (44–133 µmol/L). Urine dipstick was positive for blood, protein, and leukocytes and negative for nitrites. MSU from 2 weeks before had grown *Escherichia coli* that was sensitive to nitrofurantoin and trimethoprim. Results of other initial investigations are shown in Figure 1.

In view of the unexplained inflammation with renal, joint, and haematological involvement, a provisional diagnosis of systemic lupus erythematosus (SLE) was made. Differential diagnoses included occult sepsis (puerperal or urinary being considered most likely), HELLP syndrome, and a primary autoimmune nephropathy.

The patient was started empirically on broad-spectrum intravenous antibiotics (gentamicin and co-amoxiclav) while confirmatory investigation results were pending.

On day 2 of admission, the patient’s level of consciousness decreased to Glasgow Coma Scale (GCS) 10, with delirium and agitation. This was considered to possibly represent either neurological involvement in SLE or delirium due to sepsis. Antibiotic coverage was changed to
intravenous ceftriaxone and acyclovir, and bacterial meningitis, viral encephalitis, and thrombotic thrombocytopenic purpura were added to the differential diagnoses.

An urgent head computed tomography scan was performed, which showed no abnormalities. The patient was transferred to ITU for observation of consciousness level, which returned to GCS 15 over the course of several hours. A lumbar puncture was considered, but was not performed because of persisting profound thrombocytopenia.

By the end of day 3 after admission, a diagnosis had still not been made. There was no antibody evidence of SLE or any other autoimmune process. Blood films and bone marrow aspiration had shown no evidence of haemolysis or malignancy, two sets of blood cultures and a vaginal swab had been negative, and abdominal ultrasound had failed to reveal a source of infection. Blood films showed toxic granulation of neutrophils, consistent with systemic sepsis. A complete list of investigations up to this point can be seen in Figure 2.

Although still without a diagnosis, the bone marrow aspirate and blood film results and low reticulocyte count were more consistent with severe sepsis causing bone marrow suppression than an autoimmune haemolytic process. Along with the negative autoimmune tests, SLE was now considered less likely. The significance of the borderline positive mycoplasma serology was doubtful. Doxycycline was added to the antibiotic regimen, and plans were made to repeat the titres in 1 to 2 weeks.

On the evening of day 3 after admission, the patient unexpectedly developed sinus bradycardia at a rate of 35 bpm. A transthoracic echocardiogram revealed a large echogenic mass attached to the anterior leaflet of the tricuspid valve consistent with a vegetation or thrombus, moderate
tricuspid regurgitation, a mildly dilated right heart with reduced right ventricular function, and mild left ventricular systolic impairment (Figure 3).

The patient was re-examined by two cardiologists and a cardiothoracic surgeon for clinical evidence of endocarditis. No murmur was identified. There was some speculation as to whether or not there were two splinter haemorrhages on the left thumbnail, but this was not considered definitive.

A computed tomographic pulmonary angiogram was performed to look for septic emboli and showed widespread bilateral subsegmental emboli across both lungs. Her antibiotic coverage was changed again to daily gentamicin, ceftriaxone, and vancomycin. A plan was made to treat with two weeks of intravenous antibiotics with the current regimen, then to repeat the echocardiogram.

After 2 weeks, a repeat echocardiogram showed no significant change, nor was there inflammatory resolution: C-reactive protein, after initially decreasing, remained consistent at >300 mg/L (<5 mg/L). The patient’s arthralgia also failed to improve. Repeat mycoplasma serology failed to show rising titres, confirming suspicion that the borderline positive result was not significant. Figure 4 shows blood results 2 weeks after admission.

For definitive treatment, the patient was scheduled for tricuspid valve removal and replacement. Sixteen days after initial admission, she was transferred to a specialist cardiothoracic centre. Operative findings included pericardial effusion, severe right atrial dilatation, a volume-loaded right ventricle, and a large vegetation on the anterior and posterior leaflets of the tricuspid valve. The mural leaflet was spared. The tricuspid valve was removed, and a 27-mm biological valve was inserted.
A postoperative echocardiogram showed good valve function with a small amount of paravalvular leakage. Pericardial fluid and vegetation microscopy, sensitivity, and culture failed to identify a pathogen. A sample of the vegetation was sent to a reference laboratory. The pathogen was eventually identified by 16S ribosomal DNA sequence analysis as Streptococcus Lancefield Group B (*Streptococcus agalactiae*).

The source remained unclear; there was no clinical evidence of chorioamnionitis or infection of the episiotomy incision. Asymptomatic infection at either of these sites could have caused haematogenous spread. Another possibility is transient bacteraemia from superficial colonisation with Group B Streptococcus, without a primary local infection. Antenatal screening for Group B Streptococcus colonisation is not routine in the UK and was not performed in our patient.

The patient was continued on the antibiotic regimen of gentamicin, vancomycin, and ceftriaxone for an additional 22 days. After this period, all inflammatory markers had normalised. The patient’s original polyarthritis finally resolved. At the 3-month follow-up, all abnormal blood parameters had returned to normal levels (Figure 5). The patient was pain-free with a normal exercise tolerance.

**Discussion**

This case is a reminder of the heterogeneity of conditions that can present with musculoskeletal symptoms. Practically any infectious process may cause a reactive polyarthritis, although this is more common with some organisms (e.g., *Chlamydia*) than others.
It is important to remember that it is not uncommon for malignancies to present with musculoskeletal symptoms. This may occur by various mechanisms, including bone pain from metastases or lytic lesions, paraneoplastic polyarthritis (mostly seen in breast, lung, and renal cell carcinoma), or polymyositis/dermatomyositis.

This case also highlights the need for a systematic approach to diagnosis of inflammation of unknown origin. A useful approach is to follow that of pyrexia of unknown origin [1], the main diagnosis categories of which are infection, autoimmune disease, and malignancy.

Infective endocarditis is a relatively uncommon condition that, if undiagnosed, leads to serious morbidity and mortality [2]. There are many documented instances of infective endocarditis presenting in an atypical fashion [3,4]. This case presented a particularly difficult diagnostic challenge. At no point in this patient’s admission did she display even a low-grade fever (the most sensitive clinical symptom/sign [5]), increased neutrophil count, murmur, or clinical signs of heart failure.

Furthermore, the patient met the diagnostic criteria for SLE, displaying 4 of the 11 diagnostic features: non-erosive arthritis, haematological manifestation (thrombocytopaenia), renal involvement (proteinuria), and neurological involvement (acute confusional state).

Streptococcus Lancefield Group B (GBS) endocarditis is associated with pregnancy and older patients with comorbidities. Our case shows typical complications of mild systolic dysfunction of both ventricles and requirement of valve replacement.
GBS is a common pathogen in puerperal sepsis. A correlation between pregnancy and GBS tricuspid endocarditis is therefore conspicuous by its absence: a literature review revealed only seven cases of pregnancy-associated GBS tricuspid endocarditis. [6].

Because GBS screening is not routinely performed in the UK, our patient was not screened antenatally. Because of the rarity of GBS endocarditis, it is doubtful whether a positive result would have given an indication of the diagnosis. A debate of the benefits of antenatal GBS screening is beyond the scope of this case report. GBS endocarditis is certainly not a common enough post-partum complication to be used as an argument in favour of screening.

**Conclusion**

In conclusion, we report an atypical presentation of infective endocarditis presenting with features of an inflammatory polyarthritis. This case highlights the importance of considering empirical investigation for bacterial infection in any patient with unexplained biochemical evidence of inflammation, even in the presence of clinical features suggesting a primary rheumatological disorder.

**Consent**

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.
Competing Interests

The authors declare that they have no competing interests.

Authors’ contributions

PV collated clinical details and investigation results of the case and was the primary author of the manuscript. RD performed imaging of the tricuspid valve, chose a still image for submission, and was a major contributor to the literature review. DR was a major contributor in establishing the narrative of the case presentation. All authors read and approved the final manuscript.


5. Mylonakis E et al. Infective Endocarditis in Adults NEJM November 2001 345/18(1318-30), 0028-4793;0028-4793

Figure Legends

Figure 1. Results of initial investigations. Routine investigations upon admission showed marked systemic inflammation, renal failure, thrombocytopenia, and hypoalbuminaemia.

Figure 2. Further investigations available by day 3. Although a diagnosis was still lacking, results at this time pointed more toward severe sepsis than any other of our differentials.

Figure 3. Transoesophageal echocardiogram image of tricuspid vegetation. After initial imaging of the vegetation by a transthoracic echocardiogram, a transoesophageal echocardiogram was performed to rule out an associated root abscess and in anticipation of a preoperative work-up.

Figure 4. Blood results 2 weeks after admission. Although the patient’s profound thrombocytopenia had resolved, antibiotic therapy had failed to affect the increased C-reactive protein levels or hypoalbuminaemia.

Figure 5. Blood results 3 months post-valve replacement. Results at 3 months showed complete resolution of abnormal results.