CASE REPORT

Recurrent pericardial effusion: the value of polymerase chain reaction in the diagnosis of tuberculosis

B S Rana, R A Jones, I A Simpson

Abstract

A 23 year old army man presented with progressive dyspnoea and was found to have a massive pericardial effusion. Despite extensive investigations the cause remained elusive, until samples were sent for polymerase chain reaction (PCR). This case was unusual for several reasons and is a reminder of the atypical way in which tuberculosis infection can present and how a high index of suspicion should be maintained. It shows the importance of molecular biological advances in providing simple and rapid methods for arriving at the correct diagnosis, by way of nucleic acid probes and polymerase chain reaction.

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Keywords: polymerase chain reaction; tuberculous pericarditis; pericardial effusion

A 23 year old army tuba player presented with mild but progressive dyspnoea and a vague history of dysphagia and epigastric discomfort. Six months previously, he had contracted a lower respiratory tract infection. His medical history included BCG vaccination. Two years earlier he had served in Bosnia. Although air entry was reduced at the left base, examination was unremarkable. The chest x ray showed a globular cardiac shadow with clear lung fields. Echocardiography showed a massive pericardial effusion with evidence of right atrial diastolic collapse (fig 1). At pericardiocentesis, three litres of bloodstained fluid were drained. The fluid contained an abundance of lymphocytes but microbiology and cytology were negative. Full blood count, renal function, bone profile, clotting studies, and liver function tests were normal. Inflammatory markers (erythrocyte sedimentation rate (ESR)/C reactive protein), viral serology (including influenza A and B, streptococcus, Borrelia burgdorferi, mycoplasma, chlamydia, respiratory syncitial virus, adenovirus, and hepatitis B antibodies), microbiology (including syphilis), and autoimmune and malignancy screens (CA 125, human chorionic gonadotrophin, carcinoembryonic antigen, a fetoprotein, lactase dehydrogenase (LDH)) were all unremarkable. Thyroid function was normal. A mantoux test was positive at 1:1000, consistent with previous BCG vaccination, while alcohol acid fast bacilli (AAFB) stain and special culture for tuberculosis were found to be negative. The patient was HIV negative.

Computed tomography (CT) of the chest revealed a bulky anterior and superior mediastinum but no lymphadenopathy. Three weeks after the initial procedure the pericardial effusion reaccumulated and needed further drainage. Bronchoscopy and mediastinoscopy with pericardial biopsy were performed, and a pericardial window made. Despite this intervention the effusion reaccumulated for the third time. The pericardial biopsy showed non-specific changes. Further high resolution spiral CT scanning of the chest revealed areas of pericardial calcification posterior to the left ventricle, and small calcified nodes in the lower left hilar and paraoesophageal region. The mediastinum appeared to be oedematous. Lymphoma was considered unlikely because of the full blood count and normal LDH and ESR, and lack of clinical signs and symptoms. The radiological appearances suggested chronic mediastinitis, and, in view of the tissue calcification, tuberculosis infection was considered likely. Because of the results of the CT scan, pericardial fluid was sent for polymerase chain reaction (PCR); the test for Mycobacterium tuberculosis infection was positive. Thus, tuberculous pericarditis was diagnosed and the patient started antituberculous therapy.
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diagnosis of primary acute pericarditis. Am J Cardiol 1995;
5:378–82.

Discussion
In industrialised countries, the incidence of
tuberculous pericarditis has declined over the
past 40 years. 1 In the United Kingdom it is now
more common, particularly as a consequence of
immunosuppression, and is seen frequently
in patients with AIDS. Spread to the pericardium occurs most often by local extension
from hilar and mediastinal lymph nodes. 2
Tuberculous pericarditis may also be seen in
association with pulmonary or disseminated
tuberculosis. In patients with pulmonary dis-
ease, the incidence of concomitant pericardial
disease ranges from 1–8%. 3 Often, patients will
present with non-specific signs—such as, fever,
night sweats, fatigue, and dyspnoea. Pericardial
effusion usually follows.

Our patient was HIV seronegative, and
systemic upset was absent; this was an unusual
presentation in an otherwise fit young man. He
played the tuba in the army band, and he was
probably exposed to the disease when he was
stationed in Bosnia two years earlier.

It is notoriously difficult to isolate M tubercu-
losis from pericardial fluid. AAFB smears are
usually negative, but culture is positive in
50–86% of cases. 7 Our case shows the
importance of PCR in arriving at the correct
diagnosis. Advances in molecular techniques
have created methods that aid identification of
the presence of infectious agents that have been
difficult to isolate previously. The use of DNA
probes with amplification and hybridisation of
tuberculosis DNA which is present in clinical
samples, such as pericardial fluid, has been
validated and allows the disease to be diag-
nosed earlier. 4 More recently, the use of reverse
transcriptase PCR as a more accurate guide to
the identification of viable M tuberculosis has
been explored, and in the future may improve
diagnostic sensitivity. 4

Interestingly, pericardial biopsy was unhelp-
ful in this case but reports suggest the yield to
be in the range of 83–100% in HIV negative
patients; 3 this does not exclude a diagnosis of
tuberculosis, as this case shows. Recently,
raised adenosine deaminase activity has been
useful in diagnosing tuberculosis (in circum-
stances where connective tissue and lympho-
proliferative disorders can be excluded). 5
Survival rates have been shown to improve with the
use of adjunctive steroid treatment, 6 reducing
mortality and morbidity from complications
such as constrictive pericardial disease.

Key points
This case was remarkable because:

It was an unusual presentation because of
the lack of constitutional upset expected
with active tuberculosis infection, impor-
tantly, the absence of fever and night
sweats

The patient was HIV seronegative, which
is an atypical finding in a patient with
these symptoms and with no underlying
immunosuppression

Despite repeated testing, the culture was
negative for tuberculosis

It shows the importance of molecular
biological advances in providing rela-
tively simple and rapid methods for
reaching a correct diagnosis

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