

Case reports

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Pulmonary valve gonococcal endocarditis

A forgotten disease

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SUMMARY Although gonococcal infections of the pulmonary valve were common before the introduction of antibiotics, such infections have rarely been reported since penicillin became available. In an elderly man with gonococcal endocarditis of the pulmonary valve the non-specific signs and symptoms, the late appearance of a pulmonary murmur, and the sterility of early blood cultures made the diagnosis unclear until three weeks after admission. Endocarditis was localised to the pulmonary valve by M-mode and cross-sectional echocardiography. Echocardiography may be useful for diagnosing endocarditis in patients with fever of unknown origin. Gonococcal infection should be suspected in patients with pulmonary vegetations and sterile blood cultures.

Although the occurrence of right sided endocarditis has increased in recent years, the incidence of gonococcal cardiac infections has fallen precipitously during the antibiotic era.¹ Because the results of blood cultures may be negative in such patients and the clinical picture non-specific, echocardiography is a valuable diagnostic technique. We report a case of isolated gonococcal infection of the pulmonary valve localised by echocardiography.

Case report

A 66 year old man was admitted to this hospital with weight loss (16 kg) and fever. He had been healthy until two months before admission when he developed a urethral discharge which resolved after two weeks. Two weeks before admission he developed night sweats, chills, and a cough.

Initial examination showed a chronically ill man with a blood pressure of 140/80 mmHg, a pulse of 100 beats/minute, and fever spiking to 102°F. Rales were present at both lung bases. The point of maximum cardiac impulse was not palpable, and heart sounds were faint. There were no murmurs or gallops. The liver was palpable 4 cm below the right costal margin, and left upper quadrant fullness was noted. There was clubbing of the fingers, and multiple 3-4 mm petechiae were evident over the ankles.

He had a normocytic normochromic anaemia (haematocrit of 23%). The white blood cell count was

$6.9 \times 10^6/l$ ($6900/cm^3$) with 82% polymorphonuclear leucocytes, 5% band cells, 12% lymphocytes, and 1% monocytes. The blood urea nitrogen was 20.3 mmol/l (57 mg %) and creatinine 0.25 mmol/l (2.8 mg %). Liver enzyme activity was minimally increased. Urinary sediment showed many red blood cells and 3-28 white blood cells per high power field, but cultures were negative. The daily urinary protein loss was 2.9 g/l, and the creatinine clearance was reduced to 33 ml/min. There was non-specific T wave flattening in the lateral leads of the electrocardiogram, and the chest x-ray film showed no abnormality. The initial blood cultures were sterile seven days later.

Investigations for tumour, tuberculosis, and multiple myeloma were negative. Daily fevers persisted, and on day 10 of admission, a grade II/VI early systolic murmur was heard at the left sternal border. After nine days' incubation, two of four blood cultures obtained on day 11 grew *Neisseria gonorrhoeae*, and treatment with intravenous penicillin was begun. The next day an M-mode echocardiogram showed dense shaggy echoes on the posterior pulmonary valve cusp (Fig. 1), and cross-sectional echocardiography indicated a 2 cm mobile vegetation (Fig. 2). The only other notable features were left ventricular hypertrophy, mild left atrial enlargement, and a calcified mitral annulus. The tricuspid, mitral, and aortic valves were normal. A lung scan showed no pulmonary emboli.

The patient's recovery was complicated by drug

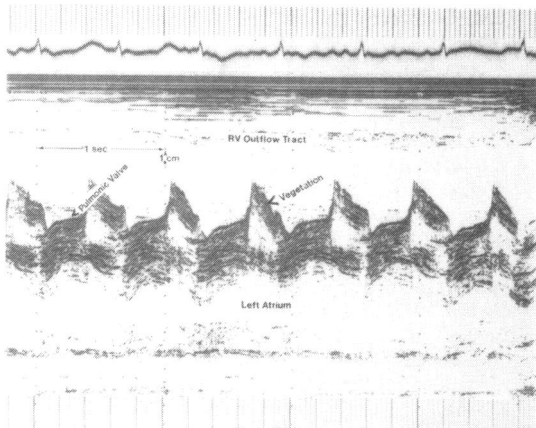


Fig. 1 *M*-mode echocardiogram of the pulmonary valve from the parasternal window showing increased systolic echoes in the vicinity of the posterior pulmonary cusp. RV, right ventricle.

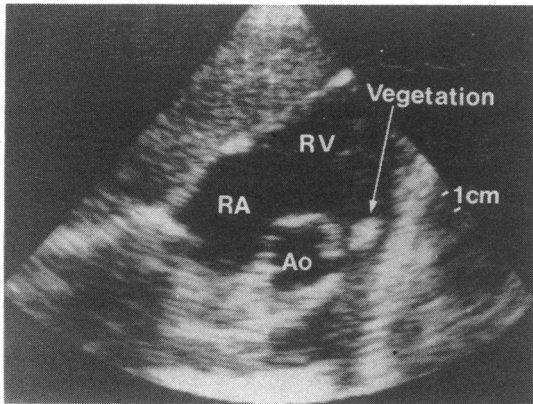


Fig. 2 Cross-sectional echocardiogram of the right side of the heart from the subxyphoid region. A 2 cm mass attached to the pulmonary valve is clearly evident. RA, right atrium; RV, right ventricle; Ao, aortic root.

reactions to penicillin and cefoxitin, and a four week course of treatment was completed with intramuscular spectinomycin. Intercurrent renal failure necessitated peritoneal dialysis. He developed peritonitis with blood cultures showing enterococci and *Proteus mirabilis*, which required four weeks' treatment with vancomycin and gentamicin.

On day 59 a new decrescendo blowing diastolic murmur was heard at the upper left sternal border. A repeat echocardiogram showed a less mobile vegetation. Right ventricular enlargement and paradoxical septal motion were consistent with the onset of pulmonary insufficiency. He was discharged on day 82, at which time blood cultures were repeatedly negative and renal function was returning to normal. He remains well one year after discharge.

Discussion

Until 1942, gonococcal endocarditis was relatively common, causing up to 26% of reported cases of endocarditis.¹ Despite the current worldwide prevalence of gonococcal infections the incidence of endocarditis is low, and most reported cases have occurred in patients under 40 years of age.

In his review of cardiac complications of gonococcal infections in 1922, Thayer² reported a 25% incidence of pulmonary valve infection in 20 patients with gonococcal endocarditis seen at Johns Hopkins Hospital, and a 12.5% incidence in 60 patients in published reports. The pulmonary valve was second only to the aortic valve in frequency of infection. Since penicillin has become available, however, isolated pulmonary valvular gonococcal endocarditis has been reported only twice. The first report was in 1947,³ when the infection was considered clinically to affect the pulmonary valve because of the characteristic location of the systolic and diastolic murmurs which the patient eventually developed and because multiple septic pulmonary emboli were present on chest x-ray films. In the second case,⁴ as in ours, the lesion was localised by echocardiography.

Echocardiographic evidence of a pulmonary vegetation was first reported by Kramer *et al.*⁵ in a narcotics addict with pseudomonal endocarditis. The characteristic finding was a shaggy density on the posterior pulmonary cusp, with variable intensity during the cardiac cycle. In subsequent reports echocardiographically localised pulmonary vegetations have also been due to virulent organisms—frequently *Staphylococcus aureus*⁶—and have often occurred in narcotics abusers.⁷ Cross-sectional echocardiography is superior to *M*-mode studies in that it offers several acoustic windows, thereby maximising the chances of visualising the pulmonary valve, even when parasternal study is technically difficult. It also allows definition of size, shape, and mobility of the lesion.

Most recently, reported cases of gonococcal endocarditis have concerned the aortic or mitral valves, and echocardiography has proved valuable in localising these lesions as well.⁸⁻¹⁰ An appreciable minority of reported cases of gonococcal endocarditis, however, has not been localised to any valve,¹ perhaps because clinical signs were either subtle or absent. The experience with pulmonary valve lesions underscores this observation. There was no murmur of pulmonary insufficiency in the patient in the present report until eight weeks after the echocardiogram showed the vegetation. Because of the susceptibility of *N gonorrhoeae* to antibiotic treatment pulmonary valve lesions are no longer commonly found at necropsy. It is possible, however, that the present incidence of pulmonary gonococcal

infection is higher than presently suspected and that with increasing use of echocardiography these lesions will be more easily detected.

This and the previously reported cases of pulmonary valve gonococcal endocarditis^{3,4} have several common clinical characteristics. Originally, the diagnosis was unclear. All the patients presented with fever of unknown origin without localising signs or symptoms, and in two patients initial investigations suggested non-infectious disease. All tolerated pulmonary insufficiency without difficulty.

This case re-emphasises the affinity of *N gonorrhoeae* for the pulmonary valve. Gonococcal endocarditis is unusual at present and is not likely to be suspected in the elderly. In addition, pulmonary infection is extremely difficult to define because of non-specific complaints and murmurs and the possible absence of positive blood cultures. This elderly man presented with a subacute illness which eventually proved to be gonococcal pulmonary endocarditis and was successfully treated with antibiotics alone. No invasive procedures were required. Echocardiography, both M-mode and cross-sectional, defined the pulmonary valve vegetation. In patients with fever of unknown origin this non-invasive technique may detect unsuspected vegetations. The possibility of *N gonorrhoeae* infection should be borne in mind in patients—especially those who are not drug addicts—with isolated pulmonary valve vegetations.

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