Prosthetic Valve Endocarditis Due to *Mycobacterium chelonei*

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Postoperative prosthetic valve endocarditis due to *Mycobacterium chelonei* occurred in a man after replacement of the aortic valve. The organism was isolated from blood cultures and from vegetations taken postmortem from the edge of the inserted valve. This is believed to be the first documented report of a mycobacterial endocarditis.

Although only a small percentage of patients with prosthetic heart valves develop postoperative endocarditis, this infection is always severe and often fatal. The tissue adjacent to the inserted foreign body or the sutures may become a target for a wide variety of bacteria or fungi which are under ordinary circumstances of low pathogenicity. In this report we present a patient with prosthetic valve endocarditis due to *Mycobacterium chelonei*. The pathogenicity of this organism is still poorly defined. In the competent host it is capable of causing localized, indolent abscesses, usually on the site of contaminated injections. In the compromised patient this organism may be far more aggressive than has previously been recognized.

CASE REPORT

W.A., a 45-year-old agricultural worker, had been well until June 1972 when he developed shortness of breath, productive cough, and fever. A diagnosis of endocarditis was considered because of elevation of temperature (38 to 39°C), splinter hemorrhages, and signs of aortic insufficiency and stenosis. There was no splenomegaly. Laboratory examinations revealed anemia, elevated blood sedimentation rate, a positive R.A. latex fixation test, and microscopic hematuria. Repeated blood cultures were negative. Severe congestive heart failure developed gradually and fever continued despite treatment with ampicillin. The patient was transferred to our hospital for aortic valve replacement in the hope of overcoming the infection and correcting the hemodynamic disturbances. On 20 March 1973 the aortic valve was replaced with a Bjork Shiley 27-mm artificial valve. The removed valve showed acute bacterial endocarditis with vegetations containing gram-positive cocci. This was superimposed on an old, healed rheumatic process.

After the operation the temperature subsided and the congestive heart failure regressed. The patient made good progress and left the hospital but was readmitted in June for recurrence of weakness and fever. Radiological examinations revealed a round, pulsating lesion close to the right border of the heart. Blood cultures were taken and treatment with penicillin and streptomycin and later with lincomycin and cloxacillin was started. However, the temperature remained high and his condition deteriorated. He died suddenly 4.5 months after valve replacement, before the nature of the pulsating shadow could be established.

AUTOPSY FINDINGS

Two thousand milliliters of partially clotted blood was found in the right pleural cavity. The heart was markedly hypertrophied (600 g). The ascending aorta showed a fusiform aneurysmal dilatation 1.5 cm distal to the prosthetic valve. This was adherent to the right atrium with a perforation connecting the two lumina. The right atrium was markedly dilated and showed extensive necrosis and hemorrhage of the wall. Several white, friable vegetations, 0.5 to 2 cm in diameter, were found attached to the edge of the prosthesis as well as on the transverse operative incision of the aorta 2 cm distal to the valve.

Histological examination revealed an intense infiltration of polymorphonuclears throughout the entire thickness of the wall of the ascending aorta (Fig. 1). On the intimal surface and penetrating deeply into the vessel wall were large collections of acid fast bacilli (Fig. 2). Such organisms were also demonstrable in the vegetations.

The kidneys were enlarged, markedly congested, and studded with numerous small abscesses. Septic emboli could be demonstrated in the small vessels. No acid fast bacilli were seen.
Examination of other organs did not reveal any other relevant findings.

**Bacteriology.** Of 13 blood cultures, taken before and during antibiotic treatment, six grew a mycobacterium and an identical organism was isolated from vegetations taken during autopsy from the edge of the prosthetic valve. On primary isolation the bacteria grew in 3 to 4 days on blood agar and Mueller-Hinton agar at 37 C. Colonies on Loewenstein medium were pale yellow. No pronounced pigment was produced on longer incubation either in the dark or on exposure to light. The niacin test was negative. The arylsulfatase test was strongly positive at 3 days. No growth was obtained on MacConkey agar. The nitrate reductase test was negative. Thus the organism was identified as *M. chelonei* (abscessus). This classification was confirmed by W.B. Schaefer, Denver, Colo., by means of agglutination and agglutinine absorption tests. The inability to grow on MacConkey agar may relate this strain to the geographical variant of *Mycobacterium chelonei* prevalent in Europe (9). The organism was found by disk and tube dilution methods to be resistant to ampicillin, cephaloridine, tetracycline, chloramphenicol, streptomycin, para-amino-salicylic acid, and isoniazide, but sensitive to kanamycin and gentamicine.

**DISCUSSION**

Prosthetic valve endocarditis has emerged as a distinct clinical entity as more and more
cardiac valve replacements have been performed. The infecting microorganisms have been performed to be quite different from those causing subacute bacterial endocarditis. In addition to *Staphylococcus epidermidis* and *Staphylococcus aureus*, which have been isolated from a majority of patients, various streptococci and opportunistic fungi have been encountered (4, 7). We are not aware of a previous report on mycobacteria as a cause of endocarditis.

*M. chelonei*, like *Mycobacterium fortuitum*, to which it is closely related and from which it has been differentiated only recently (5, 6, 8), belongs to the rapidly growing mycobacteria and is widely distributed in nature. Its physiological and pathogenic features are very different from the mycobacteria causing tuberculosis. In man it is a cause of subcutaneous abscesses after traumatic injury or postinjection abscesses on the site of inoculation, and it was first named *Mycobacterium abscessus* until the present designation was adopted. In addition to single cases, several outbreaks of postinjection abscesses have been reported, one involving 50 children (2, 5). Such abscesses may be slow in developing, even up to several months after injection with contaminated needles, drugs, or vaccines. Infection of the lung or disseminated disease due to this bacterium are rare, but the compromised patient is at risk. Two recipients of kidney transplants who developed a progressive infection due to *M. chelonei* producing multiple abscesses and osteomyelitis were reported by Graybill et al. (3).

The port of entry of the mycobacterium is not clear. No subcutaneous abscesses from which the bacterium could have reached the heart were noted in the patient. However, in the light of its ubiquitous distribution, infection with *M. chelonei* could have occurred either at the time of implantation of the aortic valve or during any of the injuries caused by intravascular catheters, venous punctures, or injections before or after surgery. In this respect it is of interest that in a survey carried out in 1966 organisms belonging to the *M. fortuitum-chelonei* group were found in dust collected from one of the wards and in soil from the gardens of this hospital (1).

**LITERATURE CITED**