Aortic Root Abscess*

Initial Experience Using Magnetic Resonance Imaging

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The detection of aortic root abscess by magnetic resonance imaging has not been described previously. We report a patient with an aortic root abscess that was successfully
diagnosed by magnetic resonance imaging and echocardiography. Computed tomography failed to detect the abscess. The patient recovered with antibiotic therapy. Based on this case and other reports in the literature, we advocate treating similar patients without surgery. We recommend magnetic resonance imaging as an investigational method where the diagnosis of aortic root abscess is ambiguous.

Although abscesses in the valve ring are frequently found at necropsy in patients with endocarditis, they are seldom diagnosed while the patients are alive. Two-dimensional echocardiography has contributed to the early diagnosis of aortic root abscesses. Newer imaging techniques using gated magnetic resonance to detect valve ring abscesses have not been evaluated. We report our initial experience using magnetic resonance imaging in a patient with an aortic root abscess.

Case Report

A previously healthy 69-year-old black man was hospitalized because of a 36-hour history of fever and rigors. Initial examination disclosed an ill-appearing man who had an oral temperature of 40.4° C, a blood pressure of 130/70 mm Hg, a pulse rate of 120 beats per minute, and a respiratory rate of 26 per minute. Cardiopulmonary examination results were otherwise normal, and the fundi and skin showed no evidence of emboli. He had mild peridontal disease, and his stool was hemocult positive. Admission laboratory examination revealed a white cell count of 3,300/cu mm. The chest x-ray film findings were normal.

On the second hospital day, his white cell count rose to 20,800/ cu mm, and he continued to have spiking fevers up to 40.6° C. Five blood cultures eventually grew three anaerobic organisms: Peptococcus asaccharolyticus, Bacteroides bivus, and Bacteroides ureolyticus. A barium enema revealed a large polyp in the descending colon. Colonoscopy with polypectomy yielded a villaglandular polyp without evidence of malignancy. An echocardiogram demonstrated a 10 × 15 mm aortic root abscess (Fig 1), and prominent vegetations on the mitral valve. A thoracic computed tomography scan failed to

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Figure 1. Two-dimensional echocardiograms in the parasternal long-axis view showing the aortic root abscess (ABS), before treatment (left) and after antibiotics treatment (right). AO is aortic root; LA, left atrium; LV, left ventricle; and RV, right ventricle.
The abscess at dimensional scanning reveal following: five patients ing Magnetic (Fig 0.5 the images were confirmed begun large and CM, Cross-sectional magnetic resonance imaging showed the abscess decreased in size from 15 to 12 mm.

**Magnetic Resonance Imaging**

Magnetic resonance images were obtained using a superconducting system (Technicare Teslacon 0.3 tesla). Spin echo images were obtained. The excitation time used was 30 ms, and the relaxation time was 0.5 s. Cardiac gating was used.

**DISCUSSION**

Osler, as well as his predecessors, recognized valve ring abscesses at necropsy. In a recent necropsy series of 95 patients with endocarditis, 27 had valve ring abscesses; and five clinical clues suggested its presence. These were the following: (1) endocarditis involving the aortic valve; (2) the presence of valvular regurgitation of recent onset; (3) evidence of pericarditis; (4) evidence of high degree of atrioventricular block; and (5) a short duration of symptoms caused by endocarditis. We found only a total of eight cases of valve ring abscesses in which the diagnosis was made ante-mortem. Of these, one did not have detailed report. Five patients underwent surgery with one death in the immediate postoperative period, and another within six months. Two patients were treated with medications alone. One of them died in the ninth month.

Our patient has done well at eight months. Although the abscess cavity is still present, it is smaller in size. The patient has no current signs of infection. In the absence of complications such as abscess rupture, hemodynamic instabilities, or large vegetations, we recommend similar patients be treated medically. Other authors support this opinion.

In recent years, magnetic resonance instruments gated to ECGs have allowed the imaging of the heart in motion. Basic principles behind magnetic resonance imaging have been reviewed. This method of imaging is attractive because it avoids the use of ionizing radiation, contrast material or radioactive tracers. Magnetic resonance imaging is capable of detecting a variety of cardiovascular abnormalities. In this report, we demonstrated with magnetic resonance imaging of structure corresponding to an aortic root abscess shown by echocardiography. We expected to have more magnetic resonance signals from this structure than we observed. This may be due to rupture of the abscess allowing blood to flow freely into the cavity or formation of gaseous material by the involved organisms within the abscess.

Specific imaging techniques may be more suited for detecting particular cardiac pathologic conditions. Our initial experience shows that magnetic resonance imaging is superior to computed tomography and can complement echocardiography in detecting aortic root abscess.

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Sarcoidosis in an Apparently Healthy Volunteer

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As previously reported in this journal, alveolitis may occur in asymptomatic individuals exposed to antigens known as causative agents in hypersensitivity pneumonitis. We found an alveolitis, probably of sarcoid origin, in an apparently healthy volunteer.

The combination of typical clinicoroentgenographic findings and tissue biopsies showing noncaseating epithelioid cell granulomas usually establishes the diagnosis of sarcoidosis. We report a case where in an apparently healthy volunteer, bronchoalveolar lavage (BAL) revealed an alveolitis. Sarcoidosis was histologically proven in spite of a normal chest x-ray film and lack of symptoms.

CASE REPORT

A 24-year-old nonsmoking male volunteer, member of the hospital staff, totally free of symptoms and medication was included in an ongoing study where BAL was performed. The physical examination and chest x-ray film were normal. The BCG vaccination had been performed at birth and at age 14 according to Swedish Health Regulations at that time. The PPD 2 TU measured 15 x 17 mm. After informed consent, the lavage was performed as previously described. Lavage data are given in Table 1. Cultures of the lavage fluid for fungi, bacteria, including mycobacteria, were negative. Subpopulations of T-lymphocytes in peripheral blood were characterized using OKT monoclonal antibodies and cytofluorography. In peripheral blood, the frequencies of OKT1+ and OKT1− cells were 31 percent and 26 percent, respectively, giving a OKT1+/OKT1− ratio of 1.1 (within the normal range in our test system). The blood differential count was normal. Serum angiotensin-converting enzyme (SACE) determined according to Lieberman was 50.3 U/ml (normal range 8 to 32). Plasma protein levels, total IgE, and liver function test results were normal. There were no antinuclear antibodies, no hypercalcemia, or hypercalciuria. The Kveim test was microscopically positive showing noncaseating epithelioid cell granulomas.

Bronchial biopsy specimens taken at a second bronchoscopy three months later showed nonspecific chronic inflammatory changes. At this time, there were still no symptoms or chest x-ray film changes.

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Table 1—BAL Fluid Parameters at the 1st and 2nd Lavage*

<table>
<thead>
<tr>
<th></th>
<th>1st BAL</th>
<th>2nd BAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instilled volume (ml)</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Recovered volume (%)</td>
<td>47</td>
<td>60</td>
</tr>
<tr>
<td>Cell recovery (x 10⁶/ml)</td>
<td>14.0</td>
<td>8.9</td>
</tr>
<tr>
<td>% Macrophages</td>
<td>74</td>
<td>88</td>
</tr>
<tr>
<td>% Lymphocytes†</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>% Polymorphonuclears</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>OKT1+</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>OKT1−</td>
<td>—</td>
<td>11</td>
</tr>
<tr>
<td>OKT1+/OKT1− Ratio</td>
<td>—</td>
<td>4</td>
</tr>
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</table>

*T-cell subsets are presented as percentage of lymphocytes.
†In control subjects (n = 20), the percentage of lymphocytes was 5.6 ± 4.6 (mean value ± standard deviation).

The SACE remained elevated to 49.6 U/ml. The BAL fluid data are given in Table 1. Pulmonary function test results were normal.

DISCUSSION

Sarcoidosis sometimes has an acute febrile onset with arthritis and erythema nodosum. However, the disease is often diagnosed in asymptomatic individuals by routine chest x-ray films revealing bilateral hilar lymphadenopathy or parenchymal infiltrates. The occurrence of uveitis, enlarged peripheral lymph nodes, or skin lesions may also indicate sarcoidosis. Our volunteer was completely without symptoms and had a normal chest roentgenogram. In spite of that, he had alveolitis consistent with sarcoidosis as judged by the findings in the lavages. Simultaneously, SACE was clearly elevated, and according to earlier findings, the probability for sarcoidosis is then more than 90 percent. As the Kveim test showed noncaseating epithelioid granulomas and false positive reactions occur in less than 3 percent, sarcoidosis seems the most likely diagnosis. The tuberculin test may well be positive in sarcoidosis. It is well known that routine chest x-ray surveys disclose unsymptomatic cases of sarcoidosis with intrathoracic changes. This case shows that sarcoidosis may be present although there are no symptoms, no physical signs, and no chest x-ray film changes indicating the disease. Thus, the true incidence of sarcoidosis may be even more underestimated than believed.

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