tory maneuvers, include blowing wind instruments, and the "voluntary pressure breathing" during mountain climbing. This so-called "voluntary pressure breathing" or "emergency breathing procedure" consists of slow, deep inhalations followed by forced exhalations through tightly pursed lips. Mediastinum and subcutaneous emphysema also occurred in a healthy medical student following a standard spirometric test. Our report illustrates another circumstance in which a ventilatory maneuver applied with diagnostic purpose, that is, the measurement of Pemax, may result in pneumomediastinum, pneumothorax and subcutaneous emphysema. However, it is important to emphasize that the risk of this kind of complication associated with maximal respiratory pressure measurements is certainly small compared with the useful physiologic information provided by this technique of respiratory muscle assessment.

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Management of Brucella Endocarditis with Aortic Root Abscess

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Three cases of Brucella endocarditis with aortic root abscess are reported. Two patients were successfully managed by a combination of medical therapy and surgery. The third patient died suddenly 36 hours after admission to hospital.

(Chest 1990; 98:1532-34)

Endocarditis is an uncommon, but serious, complication of brucellosis; the aortic is the most frequently affected cardiac valve. We report the successful management of two complex cases of Brucella endocarditis with aortic root abscess, using a combination of medical therapy and surgery; a third seriously ill patient died within 36 hours of admission to hospital.

CASE REPORTS

CASE 1

A 45-year-old man was admitted to another hospital for seven weeks in 1987 with clinical and bacteriologically proven Brucella melitensis endocarditis involving the aortic valve; two-dimensional echocardiography revealed a 3 x 4 mm vegetation on the valve. His Brucella agglutination titer was originally >1:20,000, but fell to 1:1,250 within six weeks of medical treatment with rifampicin, tetracycline, and cefotaxime, all continued for two months. He was readmitted to the same hospital nine months later with a two- to three-week history of recurrence of the symptoms and signs suggesting Brucella infection (Table 1). Table 2 contains the results of the investigations. The chest x-ray film showed mild cardiomegaly with clear lung fields. Two-dimensional echocardiographic findings are listed in Table 1 and illustrated in Figure 1.

On transfer to this hospital, medical therapy with gentamicin, 3

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Figure 1. Two-dimensional echocardiography; left parasternal view, showing the aortic root abscess (A), and vegetation (V) on the right coronary cusp. LA is left atrium; LV, left ventricle; RV, right ventricle; and S, septum.
mg/kg body weight and sulphonamethoxazole, 960 mg every eight hours, was given intravenously, together with oral doxycycline, 200 mg bid. Because of the recurrence of Brucella endocarditis, the presence of aortic valve vegetation, and the aortic root abscess, the patient was scheduled for urgent aortic valve replacement on the day after admission.

The surgical findings confirmed aortic valve stenosis, with an abscess of the aortic root below the right coronary artery ostium, and also a fistula from the aortic root to the right ventricular outflow. The aortic valve was replaced with a 21 mm prosthesis, and the fistula closed with autogenous pericardium; recovery was uncomplicated. The valve tissue culture showed B. melitensis.

Since the organism was found to be resistant to sulphonamethoxazole, rifampicin, 300 mg bid orally was substituted; intravenous gentamicin, together with oral doxycycline and rifampicin was continued for six weeks. Oral doxycycline and rifampicin were continued at the same dosage for a further six weeks after discharge from hospital.

Three months later, the patient was well, with much reduced Brucella serology titers (Table 2.)

Case 2
A 35-year-old man with a history of drinking untreated goat milk was admitted after three months of illness; clinical findings and results of investigations are listed in Tables 1 and 2.

Medical therapy was started with intravenous sulphonamethoxazole, 960 mg every eight hours and netilmicin, 3 mg/kg body weight every 24 hours, together with oral doxycycline, 200 mg bid. He was scheduled for urgent cardiac surgery one day after admission. At operation, an 8 × 6 mm friable vegetation was seen on the right coronary aortic valve cusp, with a 5 × 5 mm abscess cavity immediately beneath the commissure between the right and left coronary cusps, extending into the left ventricular outflow. The aortic cusps, with the vegetation, were removed and the abscess cavity debrided. The aortic valve was replaced with a 23 mm Carpenter-Edwards bioprosthesis, obliterating the abscess orifice. Blood and valve tissue culture grew the same B. melitensis.

He made a good recovery and was discharged to his home after six weeks of the same triple antibiotic therapy. When discharged from the hospital, the blood culture was negative and his investigation results were improved (Table 2). Oral doxycycline, 200 mg bid, and sulphonamethoxazole, 960 mg every eight hours, were continued for a further six weeks.

Case 3
A 25-year-old man had a history of brucellosis, from which he had apparently recovered, one year before the current illness (Table 1). With a provisional diagnosis of bacterial endocarditis, he received two weeks of treatment at another hospital, without positive response; he was then transferred to this hospital.

A diagnosis of bacterial endocarditis, with aortic root abscess, was made clinically and by 2-D echocardiography, possibly due to

### Table 1 — Presenting Clinical Characteristics and Investigation Results*

<table>
<thead>
<tr>
<th>Patient, Age</th>
<th>Symptoms</th>
<th>Signs</th>
<th>ECG</th>
<th>2-D Echo/Doppler Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1, 45 yr</td>
<td>Previous history of Rh F &amp; drinking raw milk; 3 weeks fever, sweating, chills, weight loss</td>
<td>Systolic thrill; moderate AR and AS; spleen was palpable</td>
<td>SR; LVH</td>
<td>LVH, good LV function, thickened, doming AV leaflets with vegetation 4 × 4 mm² on RCC. Echogenic-free space at base of aortic root involving NCC cusp (Fig 1). Doppler shows 75 mm gradient across AV with mild AR</td>
</tr>
<tr>
<td>Case 2, 35 yr</td>
<td>Previous history of Rh F &amp; drinking raw milk; 3 weeks fever, chills, weight loss</td>
<td>Collapsing pulse, absent left radial pulse; mild MR, severe AR; liver barely palpable</td>
<td>SR; LVH &amp; strain pattern</td>
<td>Thickened aortic valve; large vegetation 8 × 6 mm² on RCC extending into septal border of LV; Doppler-severe AR, small pericardial effusion</td>
</tr>
<tr>
<td>Case 3, 25 yr</td>
<td>No previous history Rh F; previous history of Brucella infection; 5 months’ fever, sweating chills, arthralgia</td>
<td>Ill looking; finger clubbing; collapsing pulse; severe AR, mild MR; hepatosplenomegaly</td>
<td>LVH</td>
<td>AV leaflet thickened with large vegetation 7 × 4 mm² involving NCC, with echogenic-free space around aortic root; good LV function</td>
</tr>
</tbody>
</table>

*AR is aortic regurgitation; AS, aortic stenosis; AV, aortic valve; LV, left ventricle; LVH, left ventricular hypertrophy; MR, mitral regurgitation; NCC, noncoronary cusp; RCC, right coronary cusp; Rh F, rheumatic fever; SR, sinus rhythm.

### Table 2 — Results of Investigations*

<table>
<thead>
<tr>
<th></th>
<th>Hb</th>
<th>WBC</th>
<th>ESR</th>
<th>IgM agglutination</th>
<th>IgG</th>
<th>Blood/tissue culture; B melitensis</th>
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<tbody>
<tr>
<td>Patient</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1</td>
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<td>11.8</td>
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</tr>
<tr>
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<td>13.0</td>
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<td>N</td>
<td>28</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>8.7</td>
<td>ND</td>
<td>N</td>
<td>ND</td>
<td>72</td>
<td>ND</td>
</tr>
</tbody>
</table>

*B. before surgery; F, follow-up; ESR, erythrocyte sedimentation rate, mm/h (Westergren); N, normal; ND, not done.
†Blood culture only.
Brucella or Staphylococcus. Triple antibiotic intravenous treatment with amoxicillin, 1 g, and clavulanic, 1 g every four hours, and netilmicin, 100 mg bid, was started, and the patient was scheduled for urgent surgery. Unfortunately, 54 hours after admission, he sustained a fatal cardiac arrest; there was electromechanical dissociation of the heart, suggestive of a possible ruptured aorta. Blood culture was positive for B melitensis; the agglutination titer level was 1:10,240, with an IgG titer of 1:1,280 (Table 2), all diagnostic of Brucella endocarditis.

Discussion

Our previous study suggested that a combination of medical therapy and surgery is necessary for the successful eradication of Brucella infective endocarditis. In the active stage of infective endocarditis, annular, or myocardial abscesses are associated with high mortality. Aggressive surgical intervention may be lifesaving in these patients.

The first of these three patients had Brucella aortic endocarditis with vegetation on the aortic valve. The endocarditis had recurred nine months after a period of eight weeks of antibiotic therapy alone, with abscess formation and a fistula connecting the aorta to the right ventricular outflow. This illustrates and supports our previous conclusion that the Brucella organism is slowly destructive and difficult to eradicate with medical therapy alone.

Some important clinical clues may suggest deep tissue invasion: the aortic valve is usually involved, and the bacteria are virulent; in these three cases, the aortic valve was involved, and the organism was B melitensis. The electrocardiographic changes of conduction defects can be a valuable clue to myocardial invasion; however, in these three cases, there was no evidence of conduction defect. The onset of pericarditis, with effusion, may indicate an annular abscess rupturing into the pericardial space; 2-D echocardiography revealed a small pericardial effusion in our second patient.

Gross abscesses of myocardium or their consequent aneurysms are apparently more frequent in Brucella endocarditis than in endocarditis caused by any other bacteria; they are apparently more frequent in endocarditis involving the semilunar valves than the atrioventricular valves. Abscesses occurred in 40 percent of fatal cases with Brucella endocarditis; 58 percent of those were due to the organism Brucella abortus.

This report of the management of three patients with Brucella endocarditis and aortic root abscesses strongly supports the conclusion from our previous study: medical therapy alone does not seem to be sufficient to eradicate an organism with such a destructive character, with a tendency toward abscess formation. Early diagnosis of Brucella endocarditis, or its complications, clinically, serologically, and by echocardiography, with CT scan if required, is the first essential. Early surgical intervention, combined with triple antibiotic therapy with an aminoglycoside and tetracycline, together with either rifampicin or sulphamethoxazole, then provides the best chance of preventing abscess formation and reduces the risk of mortality. The duration of medical therapy after early surgical intervention is still controversial, but continuation for three months may be advisable in those cases with aortic root abscess formation.

Addendum

Since this manuscript was submitted, a fourth case of Brucella endocarditis with aortic root abscess, in a man aged 28 years, has been treated successfully by the same combination of medical therapy and surgical replacement of the aortic valve.

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Ear Involvement in the Yellow Nail Syndrome*

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Recognized features of the yellow nail syndrome include yellow nails, lymphedema, and pleural effusions. We report a patient with the additional feature of keratosis obturator, which may be a manifestation of this syndrome in the external ear.

(Chest 1990; 98:1534-35)

The yellow nail syndrome was first described in 1964 with 13 cases of lymphedema associated with nail dystrophy. Pleural effusions, bronchiectasis, and sinustitis have also been reported. Hard wax impaction in the external auditory meatus, thought to represent keratosis obturans, has been associated with the yellow nail syndrome in one case report. We describe a patient in whom all these features and keratosis obturans coexist.

Case Report

A 40-year-old woman first presented in 1955 with nasal blockage and sinusitis. At the age of 55 years, a diagnosis of the yellow nail syndrome was made on the basis of chronic nail changes and persistent mild edema of her face and ankles.

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