DISSEMINATED NOCARDIOSIS PRESENTING AS TESTICULAR ABSCESS

DAVID W. STRONG, M.D.
CLARENCE V. HODGES, M.D.

From the Division of Urology, Department of Surgery, University of Oregon Health Sciences Center, Portland, Oregon

ABSTRACT — A case of a localized testicular abscess due to Nocardia asteroides in a patient on immunosuppressive therapy for a myeloproliferative disorder is reported. Subsequent fatal dissemination of the infection to the prostate, lungs, and liver occurred. This represents the second reported case of nocardiosis of the testis. Extrapulmonary forms of nocardiosis must be recognized so that appropriate treatment can be instituted prior to dissemination.

Infections with opportunistic organisms are a well-recognized and increasingly common complication in patients with impaired defense mechanisms and debilitating diseases, and in patients receiving immunosuppressive or antineoplastic chemotherapy. One such pathogen is Nocardia asteroides, and serious, often fatal, infections with this organism are frequently reported in the compromised host.14 Nocardiosis most commonly is a localized pulmonary infection, but hematogenous dissemination may occur. Primary nocardial infections in other organ systems are rare.7 We herein report a case of nocardiosis presenting with a localized testicular abscess, with subsequent dissemination and progressive fatal infection despite antibiotic therapy.

Case Report

A sixty-one-year-old mill worker with a ten-year history of a myeloproliferative disorder characterized by leukopenia, thrombocytopenia, and anemia, was admitted with persistent urinary infection unresponsive to antibacterial therapy. His primary disease had previously been treated with splenectomy, followed by corticosteroids, androgens, and cyclophosphamide. Over the previous five years he had several urinary tract infections with frequent episodes of right epididymo-orchitis and had symptoms consistent with progressive bladder outlet obstruction.

Physical examination revealed a blood pressure of 140/70 mm. Hg, temperature 101°F., and pulse rate 120 per minute. He displayed a Cushingoid appearance with multiple ecchymoses of the extremities, oral-pharyngeal moniliasis, hepatomegaly, and a systolic ejection murmur, but had no costovertebral angle tenderness. The prostate gland was enlarged but of normal consistency with no apparent tenderness or fluctuance. The right testis was twice normal size, indurated, and tender to palpation, but without obvious evidence of abscess.

Admission laboratory studies revealed a hematocrit of 31.5, white cell count 4,100 with 37 per cent eosinophils, 31 per cent band forms, 22 per cent lymphocytes, 8 per cent polymorphonuclear leukocytes, 1 per cent metamyelocytes, and 1 per cent basophils, platelet count 27,000 per cubic millimeter, erythrocyte sedimentation rate 111 mm. at sixty minutes, blood urea nitrogen 41 mg., serum creatinine 3.1 mg., total bilirubin 2.3 mg., with 1.8 mg. per 100 ml. direct bilirubin. Electrocardiogram showed atrial fibrillation and left ventricular enlargement, and chest roentgenogram was normal. A bone marrow aspiration revealed marked hypoplasia of erythroid series with maturation abnormalities in
both granulocytic and megakaryocytic compartments, suggestive of an evolving myeloproliferative disease.

Initial treatment consisted of cephalothin and gentamicin for his urinary tract infection, nystatin (Mycostatin) for his oral monilia, and digitalis. Urine culture grew Escherichia coli and Serratia marcesens, and multiple blood cultures were positive for E. coli. An intravenous pyelogram showed normal kidneys and a trabeculated bladder with multiple diverticula. Cystoscopy revealed prostatic enlargement with bladder outlet obstruction, and Foley catheter drainage was instituted. In spite of antibacterial therapy, he continued to have persistent daily temperature elevations to 104° F. He underwent a right orchiectomy, and a large testicular abscess was found which exuded green purulent material. N. asteroides was cultured from the abscess cavity and typical branching, filamentous nocardial organisms were present on methenamine-silver stain of the testis (Fig 1A). Carbenicillin and sulfadiazine were added to the antibiotic regimen.

Following orchiectomy, he remained afebrile for one week, then daily temperatures recurred. Liver and brain scans were normal. Eventually, bilateral pulmonary infiltrates appeared and bronchial washings grew N. asteroides. Ampicillin and cycloserine were added, but the pulmonary infiltrates progressed. Subsequently multiple herpes simplex skin lesions and severe mucocutaneous and gastrointestinal monilia developed unresponsive to oral treatment and intravenous amphotericin. His condition continued to deteriorate, and respiratory insufficiency ensued. Fever persisted and serial chest x-ray films showed rapid progression of the pulmonary infiltrates and appearance of bilateral pleural effusions. Despite intensive antimicrobial therapy the patient died on the seventieth hospital day. At postmortem examination multiple nocardial abscesses were found in both lungs, liver, rectovesical pouch, and prostate gland (Fig. 1B and C).

Comment

N. asteroides is a gram-positive, aerobic, branching filamentous organism, which is partially acid-fast. Originally classified as a fungus, it is now recognized that it is more closely associated with the bacteria. It's distribution is world-wide, and the portal of entry in the majority of cases is respiratory or cutaneous. Hematogenous dissemination of the organism has been emphasized, and it frequently involves the central nervous system. The diagnosis of nocardiosis is usually made from sputum culture or from cultures of metastatic abscesses. In one recent report, fungal blood cultures have been recommended to help in establishing an early diagnosis of dissemination when the disease is suspected. Sulfonamides remain the drugs of choice in treatment of nocardiosis with sulfadiazine being the most frequently employed. Other antibiotics recommended include penicillin, chloramphenicol, and cycloserine.

The opportunistic nature of this organism is evident in that the great majority of cases have been associated with such underlying conditions.
as lymphoma, sarcoidosis, cancer, systemic lupus erythematosus, pulmonary alveolar proteinosis, ulcerative colitis, Cushing's disease, intestinal lipodystrophy, and immunosuppression following organ transplantation. A significant incidence of nocardial infection is present in patients receiving antineoplastic chemotherapy. With the continued use of steroids and immunosuppressive agents in patients with serious underlying diseases, and those undergoing organ transplantation, an increase in the frequency of disseminated nocardiosis has been stressed. This organism was found in 17 patients during a ten-month period in one recent report.

Presant, Wiernik, and Serpick reported the first case of primary nocardial infection of the urinary tract when they described a patient who presented with a solitary nocardial renal abscess and in whom disseminated disease later developed involving the skin and central nervous system without pulmonary infection. One of the cases of pulmonary nocardiosis described by Young et al. was found to have a scrotal abscess at autopsy from which Nocardia was cultured. Only one prior instance of nocardiosis of the testis has been described. In that report bilateral lung abscesses preceded the nocardial testicular abscess, suggesting primary pulmonary infection with hematogenous dissemination.

In the case reported here, the actual portal of entry for this organism is not definitely established, but evidence favors the urinary tract since the initial chest x-ray film was negative, there were no respiratory symptoms, and no cutaneous infection was apparent. The history of multiple episodes of right epididymo-orchitis and recurring urinary tract infection and the presence of multiple prostatic nocardial abscesses found at autopsy implicates the lower urinary tract as the site of origin from which subsequent dissemination of the organism to the lungs and liver resulted. Although the organism was not isolated from the urine, others have noted this difficulty in recovery on routine culture media, presumably due to its slow growing properties.

The response to therapy when nocardiosis is disseminated is disappointing with the mortality reported as high as 86 per cent. Nevertheless, reports have been published in which the disease has been successfully treated in the severely compromised host. Because most reports of nocardiosis have generally emphasized the importance of pulmonary involvement, primary nocardial infections in other organ systems are difficult to diagnose. Extrapulmonary forms of nocardiosis must be recognized, so that appropriate treatment can be instituted early. With the increased use of immunosuppressive drugs, steroids, and cytotoxic agents, there must also be an increased awareness of the potential for infection with this unusual organism in patients with altered immunity.

University of Oregon Health Sciences Center, Portland, Oregon 97201 (DR. HODGES)

References