Blastomycosis in Africa: a new case from Tunisia

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ABSTRACT: Although blastomycosis is prevalent in the North American continent, it occurs only sporadically in Africa. We describe a 42 yr old patient who complained of intermittent cough and haemoptysis. Clinical findings were strongly suggestive of lung cancer. The diagnosis of pulmonary blastomycosis was made at thoracotomy. This rather unusual disease in our areas caused a considerable delay in securing the diagnosis and we suggest that this infection may be found elsewhere in Africa and the distribution may be wider than has previously been suspected.

Keywords: Africa; blastomycosis; pulmonary blastomycosis; Tunisia.

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Blastomycosis was for a long time designated North American blastomycosis because it was believed that the fungus was restricted to that continent. More recently several reports have proved that the distribution of the organism is more widespread and may be quite common in Africa. A patient with pulmonary blastomycosis, of Tunisian origin, is described below.

Case report

Our patient was a 42 yr old male grocer of Tunisian origin, who had diabetes mellitus, well controlled by dietary measures. He was referred to our hospital with cough, haemoptysis and right lower chest pleuritic pain of 6 weeks duration.

The patient had a 20 pack-year smoking history and a myocardial infarction in 1987. There was no history of fever, chills, night sweats, weight loss, or exposure to tuberculosis. He had never been to America.

On admission, physical examination revealed a well-developed, well-nourished man. His vital signs were normal, with blood pressure 90/50 mmHg. Examination was unremarkable, and there were no rales or wheezes. There was no lymphadenopathy and no clubbing of fingers. Neurological examination was entirely normal. There were no skin lesions and no bone pain could be elicited.

Routine laboratory data were within normal limits. Total white cell count was 13,700 with 66% neutrophils and 34% lymphocytes. Sedimentation rate was 45 mm·h⁻¹, blood glucose 120 mg·100 ml⁻¹, serum electrolyte levels and urinalysis were within normal limits. Tuberculin skin test with 10 U of purified protein derivative was positive with an induration of 13 mm. Sputum smears for bacteria and acid-fast bacilli were negative and cytological examination revealed no abnormal cells. The chest radiograph shown in figure 1 revealed a right lower lobe rounded opacity with ill-defined border.

Fibreoptic bronchoscopy revealed mild inflammatory change of the mucosal lining. Cytological examination of bronchial washings did not demonstrate any evidence of malignancy. A computed tomography scan of the chest (fig. 2) revealed a lower lobe rounded mass measuring 5 cm in diameter, of nonhomogenous density, no hilar adenopathy was seen.

Although definite proof of the exact cause of the patient's pulmonary illness was lacking, the symptoms and chest roentgenograms were compatible with lung cancer. The patient was referred for surgery and he underwent right lower lobe resection on March 5, 1990.
Fig. 2. — Chest computed tomographic (CT) scan revealing a mass in the right lower lobe.

Fig. 3. — Section of resected specimen shows Langhan's giant cells containing yeast forms. Areas of broad-based budding, a characteristic feature of this fungus, are marked with arrows (Grocott Stain; original magnification ×1,600).

The resected specimen showed a granulomatous inflammation in which there were many multinucleated giant cells (fig. 3). Many of these contained 2–4 fungal elements. The fungi were round and a few were found with buds attached by a wide isthmus, typical of Blastomyces dermatitidis. Re-examination of the bronchial wash cytology slides obtained by bronchoscopy confirmed the diagnosis of blastomycosis (fig. 4).

Immunodiffusion test for detection of antibodies to B. dermatitidis was negative. Therapy with ketoconazole 400 mg·day−1 was initiated. When last seen in July 1990, the patient continued to have this therapy. He was in good health had no further hemoptysis or chest pain and sputum culture was negative for fungal infection. A new chest radiograph showed no new lesion.

To identify the source of B. dermatitidis infection in this patient, air and soil samples were collected from the patient's home, however, attempts to isolate the fungus were negative.

Fig. 4. — Haematoxylin and eosin stain of the bronchial wash. Blastomyces dermatitidis is distinguished by the double contoured appearance. (Original magnification ×400).

Discussion

Blastomycosis is an uncommon pulmonary mycosis which has been sporadically found in Africa. To our knowledge there have been three cases of pulmonary blastomycosis reported from Tunisia, and a few cases have been reported from different African countries [1–5]. Available clinical and epidemiological evidence suggests that humans usually acquire blastomycosis by airborne route from a natural environment. A few epidemics of infection from a presumed point-source have been reported [6, 7]. However, the natural habitat of B. dermatitidis remains poorly-defined, and the ecology of the fungus is obscure. Numerous field studies have attempted to isolate B. dermatitidis from the soil; of thousands of such attempts, only a few have succeeded [8, 9]. In our case attempts at culturing the fungus from the environment have been unsuccessful.

The likely mode of transmission of the infection is through the inhalation of aerosolized conidia. Epidemiological studies [10, 11] have shown an association between the geographic distribution of human and canine blastomycosis and residence close to a body of water. Rain, dew or mist may have a critical role in the liberation of conidia which are then dispersed. Warm soil temperature may also play a part. The occurrence of an exceptionally high amount of rain this year in Tunisia may have provided a suitable environmental condition for the growth of B. dermatitidis and the appearance of this sporadic case. It is important to know whether B. dermatitidis, which causes blastomycosis among Africans who never travelled to known endemic areas, is the same as that which causes the disease in North America.

Studies available in medical literature [1–3, 12] show that at least a few of the African isolates are closely related to the American isolates and could well belong to the same species [13].
Serological and skin tests for blastomycosis have not been sufficiently specific to be reliable for epidemiological studies or for clinical diagnosis. Immunodiffusion test has been reported to be useful in 80% of patients [14]. This test was negative in our patient. Recently, newer and more sensitive serological tests, such as radio-immunoassay (RIA) and enzyme immunoassay (EIA) have been used to screen for antibodies to B. dermatitidis [15]. Some investigators [16] have now isolated and characterized a 120 kDa protein that appears to be uniquely expressed on the surface of B. dermatitidis. It is distinct from all antigens previously studied. The molecule designated WI-1, can be radiolabelled with iodine-125 to detect antibody in infected patients reliably by RIA.

The treatment of choice is ketoconazole [17]. The current recommendation is to initiate ketoconazole therapy at 200 mg-day\(^1\) and increase by 100 mg increments over 4–6 weeks to a total of 400 mg-day\(^1\). The 400 mg-day\(^1\) should be maintained for a minimum of 6 months. In patients whose disease progresses on 400 mg-day\(^1\); consideration should be given to advancing the dosage to 600 or 800 mg-day\(^1\). The agent appears reasonably well-tolerated.

The occurrence of blastomycosis in Tunisia suggests that further studies of epidemiology and other features of blastomycosis should be conducted in Africa. The case we report is consistent with the hypothesis that B. dermatitidis exists in nature in reservoirs that are not geographically restricted, and this mycosis will be found elsewhere in Africa if physicians and laboratory workers are aware of the possibility.

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