

THE MADURA FOOT - A CASE REPORT STOPA MADURSKA – OPIS PRZYPADKU

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Abstract

Madura foot or mycetoma is a chronic granulomatous disease characterized by localized infection of subcutaneous tissues by actinomycetes or fungi. The inflammatory response can extend to the underlying bone. Mycetoma was described first in the mid 1800s and was initially called Madura foot. The infection can be caused by true fungi (eumycetoma) in 40%, or filamentous bacteria (actinomycetoma) in 60%. Actinomycetoma may be due to *Actinomadura madurae*, *Actinomadura pelletieri*, *Streptomyces somaliensis*, *Nocardia* species. The infection, which may remain latent for a time, forms small, subcutaneous swellings that enlarge, soften with pus, and break through the skin surface, with concurrent invasion of deeper tissues. Sulfonamide, iodide, and antibiotic therapy have been used against actinomycotic infections, but the fungi are more resistant to treatment. We reported a patient of Madura foot from International Medical College Hospital, Tongi, Gazipur. A 82-years old male was admitted to the International medical college hospital with a 16 months history of swelling with multiple discharging sinuses filled with granules localized in his right foot. Pus was examined by gram staining and periodic acid Schiff (PAS) staining. Moderate number of filamentous branching gram positive bacilli were found. The organism was recognized as a member of the actinomyces genus. PAS staining did not reveal any other organism. The aggressive course and progression of the disease affected the short bones of the involved foot. The patient was diagnosed as a case of Madura foot and was treated in the same hospital.

Streszczenie

Stopa Madurska lub mycetoma jest przewlekłą ziarniniakową chorobą charakteryzującą się zlokalizowanym zakażeniem tkanek podskórnych przez promieniowce i grzyby. Reakcja zapalna może rozciągać się na kości. Mycetoma po raz pierwszy została opisana w połowie 1800 roku i była początkowo nazywana stopą Madurską. Zakażenie może być spowodowane przez grzyby prawdziwe (eumycetoma) w 40% lub nitkowate bakterie (actinomycetoma) w 60%. Actinomycetoma może być spowodowana przez *Actinomadura madurae*, *Actinomadura pelletieri*, *Streptomyces somaliensis*, *Nocardia* species. Zakażenie, które może pozostawać w formie utajonej przez jakiś czas, tworzy małe, podskórne obrzęki, mogące się powiększać, pokrywać ropną wydzieliną i przebić się przez powierzchnię skóry, przy jednoczesnej inwazji w głębiej położone tkanki. Sulfonamidy, jodyna i antybiotyko terapia zostały użyte przeciwko infekcji actinomykotycznej, ale grzyby te są bardziej odporne na leczenie. Opisaliśmy pacjenta ze stopą Madurską z International Medical College Hospital, Tongi, Gazipur. 82-letni mężczyzna został przyjęty do International Medical College Hospital z 16-to miesięczną historią wielu obrzękniętych, podminowanych zatok, wypełnionych granulami, zlokalizowanych w jego prawej nodze. Wydzieliną ropną została zbadana poprzez barwienie gram oraz cykliczne barwienie kwasem Schiffa (PAS). Stwierdzono umiarkowaną liczbę rozgałęzionych, nitkowatych pałeczek gram dodatnich. Organizm został uznany za członka z rodzaju promieniowców. Barwienie PAS nie ujawniło żadnych innych organizmów. Agresywny przebieg i postęp choroby wpłynął na krótkie kości stóp. Pacjent był diagnozowany jako przypadek stopy Madurskiej i był leczony w tym samym szpitalu

Key words: Madura foot, Actinomyces, granules, pathogens, Bangladesh

Słowa kluczowe: Stopa madurska, Actinomyces, ziarnistości, patogeny, Bangladesz

Introduction

Madura foot is endemic in the tropics and subtropics. It is a deep mycosis caused by exogenous fungus or actinomycotic species. These infections lead to progressive inflammation of the skin, subcutaneous tissue, muscles and bones. The organism enters through local trauma in the foot, hand or eyes from saprophytic soil. After entry to the body they form subcutaneous nodules containing suppurative granulomas, multiple cavities and sinus tracts. The sinus tracts discharges exudates with fine grains. These grains are colonies of causal organism [1,2].

Due to the existing socio-economic condition and low living standard of the people of this area the disease is often neglected in the initial stage. Usually the diagnosis is made at an advanced stage. Good clinical response with proper pharmacological therapy alone has been reported [3]. Surgical debridement with prolonged treatment with antifungal and antibiotic has been proved effective in many cases [4]. Amputation of limbs followed by antifungal and antibiotic therapy and reconstruction have been done for a number of cases [5]. Surgical excision is necessary when bone is involved as detected radiographically [6].

In this article we are presenting a case of madura foot diagnosed and treated in a medical college hospital located at suburbs of Dhaka with limited investigation facilities. The diagnosed patient was treated with oral penicillin followed by application of local crystalline penicillin G powder with which the patient responded well. The characteristic radiological presentation, macroscopic and microscopic features are discussed in this report.

Case Report

An 82-year-old male farmer from Tongi, Gazipura presented to the International Medical College hospital on July 24, 2010 with a history of fall in a ditch in January 2009. Following that there was pain and swelling in his right foot. He was treated by local doctors with analgesic and antibiotic. The wound healed within a few days. After three months the foot again started swelling and at this time he noticed a tender, nonerythematous swelling in the same area that drained spontaneously and the wound healed. Over the next few months a number of similar smaller painless lesions were appeared in the adjacent area when the patient presented to us.

On physical examination, there was five discharging sinuses over the dorsal surface of the right foot. The sinuses were discharging pus and sulfur granules (fig.1). The patient was otherwise in good health without any sign of immunodepression. No difficulty in his walking was reported.

Laboratory investigations revealed Haemoglobin -70%, WBC total count - 8000/ cmm, ESR 48 mm in 1st hour, RBS 6.1 mmol/l , Serum creatinine-0.80 mg/dl, SGPT-38u/l , SGOT - 24.5u/l , Urine R/E , X-Ray chest and ECG were normal. X-Ray of the right foot showed sign of destruction of the navicular bone (fig.2). Microscopic picture of fine needle aspiration showed branching filamentous bacilli (Gram positive). Some scattered pus cells are also seen (fig.3).

The patient was treated with oral penicillin followed by installation of local crystalline penicillin G powder. The patient responded well in 8 weeks of treatment and was discharged from hospital on 26th November 2010.



Figure 1. Discharging sinuses on the dorsal aspect of right foot discharging white pus filled with granules.



Figure 2. Radiograph of right foot showing destruction of the navicular bone.

Discussion

Madura foot was first recognized in 1842 by Gill in Madura district of Tamilnadu in India [7]. Later Bidie and Carter gave a full description of the disease [8,9]. Mycetomas are frequent in the tropical zones of America (Mexico and Venezuela), Africa (Senegal, Mauritania and Sudan) and Asia (India), but can also be observed in other areas. Fungi, that in these rainy areas are found as saprophytes in the soil, are usually introduced through skin wounds in those who walk bare footed (farmers, nomads) and are often exposed to penetrating wounds. Infection begins in the skin and subcutaneous tissue causing local papular or nodular swelling which tends to grow and rupture, forming communicating sinus tracts through which mucous containing the characteristic colored grains is discharged. Some sinuses heal with scarring while fresh sinuses appear elsewhere, leading to enlargement and disfigurement of the affected limb. Eventually destruction of bone occurs when grains invade the cortical margins and replace the spongiosa. General complaints are rare, and fever usually a sign of secondary bacterial infection. The infection does not, in general, spread hematogenously although cases are known where particularly *Pseudallescheria boydii* and *Nocardia asteroides* in immunocompromised patients (leukemia, HIV, use of corticosteroids and immunosuppressive drugs) have disseminated hematogenously to the brain, myocardium and the thyroid gland [10,11].

The combination of the clinical picture (indurated swelling of the foot with multiple sinuses that discharge pus filled with grains), macroscopically typical grains and the histopathological appearance is characteristic of the diagnosis. Grains vary from 0.2 to 3.0 mm in diameter and can be black, white, yellow, pink or red, depending on the microorganism involved [8,12]. On microscopy a hematoxylin-eosin (HE) stain is generally able to demonstrate and identify the characteristic grains. They are surrounded by inflammation with polymorphonuclear leukocytes, epithelioid cells, plasma cells and multinucleated giant cells with areas of fibrosis. Two groups of mycetoma are distinguished : Eumycetoma (caused by eumycetes or true fungi) and Actinomycetoma (caused by fungi like aerobic bacteria from the actinomycetes species).

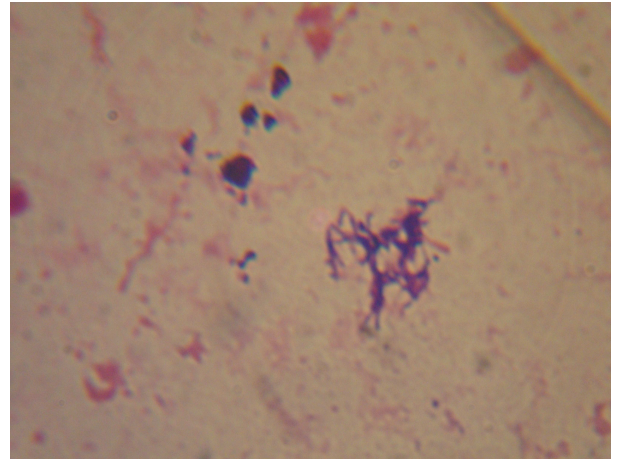


Figure 3. Microscopic picture shows branching filaments (gram positive). Scattered pus cells are also visible.

Although particular species of dermatophytes are known for their mycetoma - like infection as well, they do not lead to destruction of the bone and therefore are not considered real mycetoma [13,14]. Gram staining can be used for recognition of branching hyphae within the actinomycetes grains, while periodic acid Schiff (PAS) - staining is suitable for identification of the hyphae of eumycetes. Confirmation of the diagnosis and exact identification of the species require culture. Although theoretically more accurate than histology, culture is difficult practically and also facilities for culture was not available in this institute.

Although the clinical picture is characteristic, diagnostic confusion may occur with chronic bacterial osteomyelitis, especially when bone destruction has occurred. Botromycosis can give a similar picture; it is a chronic bacterial infection caused by gram- positive cocci (Staphylococci, Streptococci) and gram negative bacteria (*Escherichia coli*, *Pseudomonas*, *Proteus*) that can lead to subcutaneous swelling with draining fistulas. Like mycetoma, grains (colonied of bacteria) can be found in the suppurative discharge. In botromycosis, however, organs can be affected by the process too. Neoplasms (benign and malignant) should be excluded as well [15].

Commencement of treatment at an early stage is necessary to reduce the suffering of the patient and to prevent complication. Treatment of mycotic mycetomas is often unrewarding. It is based on surgical excision since chemotherapeutic agents (ketoconazole, itraconazole) are expensive and often not effective [16-22]. A delayed diagnosis may require extensive excision which may not always be adequate and more taxing to the patient. In our case, the actinomycetomas, patient responded well in 8 weeks with oral penicillin and local crystalline penicillin G powder. Penicillin is a very cheap and relatively safe drug without any remarkable side effect for most individuals. We advised the patient for follow up visits to detect any recurrence. For most drugs, it is recommended to continue treatment for at least 10 to 12 months and many of these drugs are toxic. As those drugs are toxic the patients need regular follow-up of hematologic, liver and kidney function parameters.

Conclusion

We reported a case of actinomycosis in this article. Although it is a rare disease, it might be encountered in our regular practicing life specially in a country where more than 75% of the people are working barefooted in the fields. Immediate and meticulous conservative and surgical measures could be of great benefit for these patients.

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