# A Report of Actinomycetoma from Southeastern Iran

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**Abstract:** Mycetoma is a chronic granulomatous infection present worldwide, and endemic in tropical and subtropical regions. The infection is caused by the traumatic inoculation of a fungus (eumycetoma) or a bacterium (actinomycetoma). Although several cases have been reported in Iran, this case was the first report in Sistan and Baluchestan Province – southeastern area in Iran. In this report, a 41-year-old man with a history of trauma in his foot followed by diving in a pond around Zahedan, Iran has been presented. Nodular sinus lesions containing pus and granular grains were observed. Actinomycetoma was confirmed by direct examination, culture and biochemical tests. All tests showed the causative agent of mycetoma as Actinomadura Madura.
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**Keywords**: Mycetoma; Tropical Infections; Actinomycetoma.

## Introduction

Mycetoma is a chronic granulomatous infection affecting the skin, subcutaneous tissues and bone. This infection is considered as endemic in certain foci in tropical and subtropical areas (1). The infection is caused by the traumatic inoculation of a fungus (eumycetoma) or a bacterium (actinomycetoma) (2). Mycetoma caused by bacteria can normally be managed effectively with antibacterial medication alone, while infections with fungi require antifungal medication and surgery (2).

Clinically, it is characterized by a firm swelling with abscesses and fistulae discharging pus that contains granules or grains of the causal agent. Their color, size, consistency and histopathology contribute to their identification. Cultures and metabolic studies determine the disease's etiology (3). The most common site of occurrence is foot (approximately 70% of cases), which explains the synonym *Madura foot* (4). Infection is caused by true fungi in 40% of cases, and by filamentous bacteria in 60% of cases (5).

## The Case

A 41-year-old man with a history of trauma in his foot followed by diving in a pond around Zahedan (Pabyd village), Iran referred to Nabi-e-Akram Hospital. Interconnected nodular sinus lesions containing pus and granular grains were observed by clinical examination (Figure 1). The diagnosis of Actinomycetoma was confirmed by aspiration of the pus and granule from abscess and direct examination, culture as well as biochemical tests (Figures 1-4). The smear was negative with Ziehl-Neelson (Acid fast staining) and PAS staining, but positive with gram and Gimenez staining and gram positive filamentous bacteria was observed. After growth in BHI broth (Brain heart infusion broth) and Chocolate agar, the biochemical tests were done, the results of which are followed in Table 1. All tests showed that the causative agent of mycetoma was Actinomadura Mad
ura.

**Figure 1:** Nodular sinus lesions containing pus and granular grains

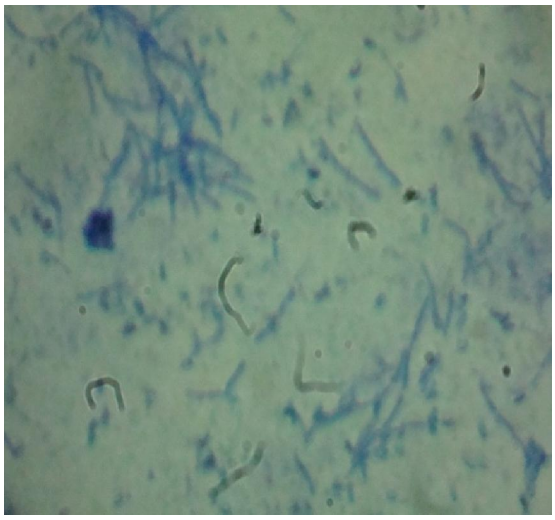

**Figure 2:** Gimenez staining, filamentous bacteria are observed in direct smear.

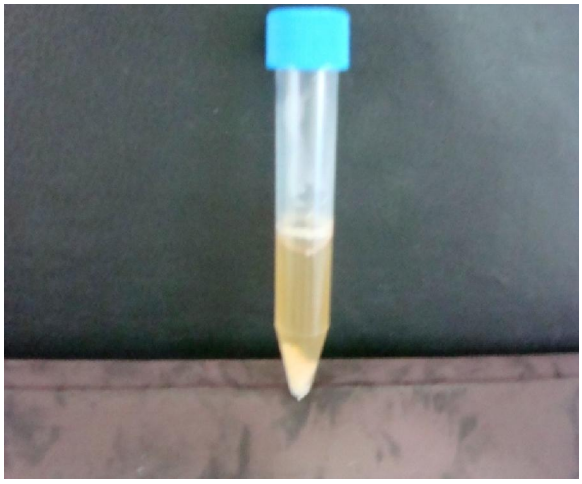

**Figure 3:** Growth of Actinomycetoma on BHI broth medium

**Table 1:** Results of biochemical tests

| Tests | Results |
|---|---|
| Gelatin hydrolysis | Positive |
| Casein hydrolysis | Positive |
| Urease | Negative |
| Xanthine hydrolyze | Negative |
| Tyrosine hydrolyze | Positive |

**Discussion**

Mycetoma is endemic in the tropics and subtropics, namely Africa, Mexico and India; it is named after the region of India where it was first described in 1842. However, it can also be found in natives of areas of Central and South America and the Middle or Far East between latitudes of 15°S and 30°N. The incidence of mycetoma is likely to rise in temperate regions as well, due to increases in worldwide travel. It commonly presents between 20 to 50 years of age, with a male to female ratio of 2.2:1 (5).

The two main etiological groups of mycetoma - actinomycetic mycetoma and eumycetic mycetoma are caused by a number of species. Over 30 species have been identified to cause mycetoma. Actinomycetoma is caused by a group of filamentous bacteria (6).

Distinction between eumycetoma and actinomycetoma is very important for the treatment (7). Grains from eumycetomas are large in comparison to actinomycetomas with an average measurement of 0.5-2.0 mm and 20-100 µm, respectively. Eumycetomas can produce both black and white colored grains that can be visualized without a microscope; most grains from actinomycetomas are white to yellow in color and are not easily seen with the naked eye (1). A Gram stain is of considerable value in distinguishing between actinomycetoma and eumycetoma; the fine, branching filaments, only about 1 micron thick, within the grains of actinomycetoma are gram-positive, whereas the grains of eumycetoma are gram negative (8).

It is essential to start the treatment at an early stage (9). Mycetoma caused by bacteria can usually be managed effectively with antibacterial medication alone, while infections with fungi require antifungal medication and surgery. Without proper treatment, mycetoma can lead to deformity, amputation, and death.

**Conclusion**

Although several cases were reported in Iran (10), this case is the first report in Sistan and Baluchistan province, Iran. In this area, foot is the most common site of affection (73.8%) (11), and in the present study, foot was infected. In other areas in Iran, the most common agents causing Actinomycetoma are Actinomadura Madura (23%). The present study showed that Actinomadura Madura caused of Mycetoma.

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