Mycetoma of Left Foot and Left Hand: A Challenging Case Report of Diagnosis and Management

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Abstract: Mycetoma is a rare and chronic infection that affects the skin, subcutaneous tissue, and bone. It is caused by several species of bacteria and fungi and is endemic in many parts of the world, particularly in tropical and subtropical regions. We report a case of mycetoma of the left foot and left hand in a 35-year-old male farmer from a rural area of a tropical country. The patient was presented with a three-year history of painless swelling and discharge from the left foot and left hand. Microscopic examination of the granules revealed branching hyphae consistent with Madurella mycetomatis, and the patient was diagnosed with mycetoma. Surgical excision and antifungal therapy with itraconazole were initiated, resulting in significant improvement in symptoms and healing of the wounds. This case highlights the importance of early diagnosis and multidisciplinary management of mycetoma.

Index Terms: Mycetoma, Diagnosis and Management.

I. INTRODUCTION

Mycetoma is a chronic and destructive infection that affects the skin, subcutaneous tissue, and bone. It is caused by several species of bacteria and fungi, and it is endemic in many parts of the world, particularly in tropical and subtropical regions. Mycetoma is characterized by the formation of granules or masses, which may cause deformity, disability, and even amputation of affected limbs. Mycetoma can be caused by bacteria, fungi or even a combination of both. It can be classified into two types; eumycetoma and actinomycetoma based on the causative organism. Eumycetoma is caused by fungi while actinomycetoma is caused by bacteria. The most common fungal species causing eumycetoma are Madurella mycetomatis, Pseudallescheria boydii, and Exophiala jeanselmei, while the most common bacterial species causing actinomycetoma are Actinomadura madurae, Nocardia brasiliensis, and Streptomyces somaliensis. Mycetoma is a neglected disease, and the diagnosis and treatment can be challenging, especially in resource-limited settings.

II. DISCUSSION

Mycetoma is a rare and neglected disease that can cause significant morbidity and disability, especially in resource-limited settings. The diagnosis of mycetoma is based on clinical presentation, imaging, and microbiological examination of the granules or tissue samples. Treatment of mycetoma requires a multidisciplinary approach, including surgical excision, antifungal therapy, and supportive care.

In our case, the patient had a longstanding and extensive involvement of the left foot and left hand, which required multiple surgeries and prolonged antifungal therapy. The diagnosis of Madurella mycetomatis, a fungus commonly associated with mycetoma, was confirmed by microscopic examination of the granules. The patient showed good response to treatment and had no recurrence of the disease during the follow-up period.

III. EPIDEMIOLOGY

Mycetoma fungal infections are more common in tropical and subtropical regions, where they account for up to 25% of all cases of mycetoma. The most affected countries are Sudan, India, Mexico, and Yemen. Fungal mycetoma tends to affect young adults more frequently than older individuals, with a male-to-female ratio of approximately 3:1. This gender difference may be due to occupational exposure, with males being more likely to engage in outdoor activities, such as farming and animal husbandry.

IV. PATHOGENESIS

Fungal mycetoma is caused by a variety of fungi, including Madurella mycetomatis, Pseudallescheria boydii, and Exophiala jeanselmei. The fungi enter the body through a cut or wound in the skin and form a mass or granule in the

subcutaneous tissues. The granule consists of a mixture of fungal hyphae, inflammatory cells, and tissue debris. Over time, the mass can enlarge, extend to adjacent tissues, and even involve the bones, leading to deformity and disability. The pathogenesis of fungal mycetoma is not fully understood, but it is thought to involve a complex interplay between the host immune response and the virulence factors of the fungi.

V. Clinical presentation

The clinical presentation of fungal mycetoma varies depending on the duration and severity of the disease. In the early stages, patients may have a small, painless nodule or swelling that gradually increases in size. As the disease progresses, the mass becomes more prominent, and the skin overlying it may become discolored, ulcerated, or fibrotic. The mass may also discharge pus, blood, or granules, which can be seen under the microscope. If the bones are involved, the patient may experience pain, stiffness, and deformity. Fungal mycetoma can affect any part of the body, but it most commonly affects the feet, legs, and hands.

VI. Diagnosis

The diagnosis of fungal mycetoma is based on a combination of clinical, radiological, and laboratory findings. Clinically, the presence of a painless mass or granule in a patient from an endemic area is highly suggestive of mycetoma. Radiological imaging, such as X-rays, CT scans, or MRI, can show the extent and severity of the disease, including involvement of the bones. Laboratory tests, such as culture and microscopy of the granules, can identify the causative fungi and guide treatment. Other tests, such as serology and PCR, may also be helpful in some cases.

VII. Management

The management of fungal mycetoma requires a multidisciplinary approach and can be challenging due to the chronic and debilitating nature of the disease. The treatment options include surgical excision, antifungal therapy, and supportive care.

VIII. Surgical excision

Surgical excision of the mycetoma mass is the mainstay of treatment, and it is essential to remove as much of the infected tissue as possible. The goal of surgery is to remove the entire mass, including any involved bone, and achieve a negative margin to prevent recurrence. In some cases, amputation may be necessary, especially if the disease has progressed to involve a significant portion of the limb or if there is a risk of complications, such as sepsis or secondary malignancy. However, amputation is not always necessary, and limb salvage surgery can be performed in selected cases.

IX. Case report

A 35-year-old male farmer presented with a three-year history of painless swelling and discharge from the left foot and left hand. The patient reported a previous injury to the left foot, which had become infected and gradually increased in size over the years. He also had a history of skin lesions on the left hand, which had appeared around the same time as the foot swelling.

The patient denied any significant medical history, allergies, or exposure to chemicals or radiation. On examination, the patient had a massive, painless swelling of the left foot, with multiple sinuses and discharging granules. The left hand showed multiple nodules and draining sinuses with purulent discharge. The rest of the physical examination was unremarkable. Radiographs of the left foot showed bone destruction and deformity, while the left hand radiographs showed soft tissue swelling and calcifications. Microscopic examination of the granules from the foot and hand revealed branching hyphae consistent with Madurella mycetomatis, a fungus commonly associated with mycetoma. The patient was diagnosed with mycetoma of the left foot and left hand and was started on a combination of surgical excision and antifungal therapy with itraconazole. Surgical excision of the mycetoma mass was performed in multiple stages, with the removal of all infected tissue and bone, including the fifth metatarsal and phalanges of the left foot. The left hand lesions were also surgically excised. The patient tolerated the surgeries well and showed improvement in symptoms and healing of the wounds. Antifungal therapy with itraconazole was continued for a year, with regular monitoring of liver function tests and serum levels.

X. Antifungal therapy

Antifungal therapy is usually administered in conjunction with surgery to prevent recurrence and manage any residual infection. The choice of antifungal agent depends on the species of the fungus and the severity of the disease. Itraconazole is the most commonly used antifungal agent for mycetoma caused by Madurella species, while voriconazole is preferred for Pseudallescheria and Exophiala species. Antifungal therapy is usually given for a prolonged period, ranging from several months to a year or more, depending on the response to treatment.

XI. Supportive care

Supportive care is an essential component of the management of mycetoma and aims to improve the quality of life of the patient. This includes wound care, pain management, physical therapy, and psychological support. Wound care involves regular cleaning and dressing of the surgical site to prevent infection and promote healing. Pain management may involve the use of analgesics or nerve blocks to alleviate pain. Physical therapy can help restore limb function and mobility after surgery, and psychological support can help the patient cope with the physical and emotional challenges of the disease.

XII. Prevention

Prevention of mycetoma fungal infection involves avoiding exposure to causative fungi. This can be achieved by practicing good hygiene, wearing protective clothing and footwear, and avoiding contact with contaminated soil or vegetation. Early detection and treatment of mycetoma are also crucial to prevent complications and minimize the impact of the disease on the patient's quality of life.

XIII. Conclusion

Mycetoma is a chronic and debilitating disease that can affect any part of the body, particularly in tropical and subtropical regions. Early diagnosis and treatment are crucial to prevent deformity and disability. Surgical excision, antifungal therapy, and supportive care are the mainstay of treatment. Further research is needed to improve the understanding of the pathogenesis and epidemiology of mycetoma and to develop more effective and accessible treatment options for patients.

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