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A Clinical and Diagnostic andApproach of Eumycetoma in the Axilla of a Patient at Tertiary Care Hospital.

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Abstract: *Madhura foot or Eumycetoma is a chronic infection of skin and subcutaneous tissues seen in tropical and subtropical countries mostly affecting lower limbs. It is a rare and neglected disease in our country[3].*
Methods*: A case of Eumycetoma of the axilla, presented with a clinical triad of tumefaction, draining sinuses and discharging granules in Dermatology Outpatient Department (OPD), King George Hospital (KGH) Visakhapatnam. Standard Mycological procedures for identification were done along with histopathological examination.*
Result*: Patient was treated with antifungal drug, Itraconazole. He showed marked improvement with healed lesions after 4 weeks.*
Conclusion*: Madura foot is a slowly, progressive destructive disease, caused by bacteria Actinomycetes or by Fungi usually affecting lower extremities[19]. However, it can occur anywhere in the body. An early diagnosis and treatment can elicit good results[20]. Delay in diagnosis leads to functional impairment.Antibiotics are the main stay of treatment in Actinomycetoma whereas, antifungals in Eumycetoma[19].*
Keywords: *Actinomycetoma, Eumycetoma,Itraconazole.*

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I. Introduction

Mycetoma is a chronic progressive granulomatous exogenous infection ofsubcutaneous tissue characterized by swelling and presence of granules of the etiological agent which may spread contiguously to involve adjoining skin with formation of multiple sinuses discharging pus, granules, fragments of degenerated muscles, tendons & bones[20]. The classical triad consists of tumefaction, drainingsinuses and discharging grains[19].

II. History

The oldest description of this disease dates back to the ancient Indian Sanskrit text Atharva Veda in which reference is made to "*padavalmikam*", meaning anthill foot. Dr. John Gill, IN 1842: described the infection of foot as, "Madura foot" as it was first seen in Madhura[3].The amputated foot has been found to be 'one mass' of fibrocartilaginous nature, with entire destruction of joints, cartilages & ligaments; it has neither shape nor feature & is covered with large fungoid excrescences discharging an offensive chorous fluid[7].Godfry first documented a case of mycetoma in Madras, India[3].Vandyke Carter, 1860: coined the term "Mycetoma". He classified the cases by the color of grains.Brumpt, in 1905, first identified a fungus genus,Madurella and described multiple fungal etiologies[8]. Later,Pinoy in 1913 recognized the possibility of classifying the cases of mycetoma by grouping the causative organisms, and the formal classification was put into place by Chalmers and Archibald who divided them into two groups.
Group 1: Maduramycosis – caused by true fungi, and
Group 2: Actinomycosis, caused by Actinomyces which belong to higher bacteria.

III. Etiology

Mycetoma are caused by various species of fungi and bacteria, which occur as saprophytes in soil or on the plants[13]. Actinomycotic mycetoma is caused by aerobic species of Actinomycetes belonging to the genera *Nocardia*, *Streptomyces* and *Actinomadura* with Nocardia *brasiliences*, *Actinomaduramadurae*, *Actinomadurapelletieri* and *Streptomycessomaliensis* being most common.Eumycotic mycetoma is associated with a variety of fungi, the most common being *Madurellamycetomatis[17]*.

IV. Epidemiology

It is found mainly in tropics & sub tropics, but sporadic in temperate zones. It is distributed between latitude 15° S and 30° N, called as "Mycetoma belt" (India, Sudan *(M. mycetomatis*), Mexico (*N. braziliensis*), Senegal, Somalia, Egypt, Uganda, Nigeria, Chad, Algeria, Mauritania, Mexico, and Venezuela)[19]. Worldwide, *M. mycetomatis* is the most common cause of this affliction. *A. madurae*, *M. mycetomatis* and *S. somaliensis* are more commonly reported from drier regions, whereas *Pseudallescheria boydii, Norcardia species* and*A. Pelletieri* are more common in those areas with higher annual rainfall[3]. In India *Norcardia* species and *Madurellagrisea* are the most common causes of mycetoma[17].Overall, most cases occur in arid regions which have short period of heavy rainfall with little temperature fluctuations. Actinomycetoma is more prevalent in drier areas, whereas eumycetoma is more common in sites with more rainfall[20].

Around 75% of mycetoma are Actinomycotic in certain parts of India. However, Eumycotic mycetoma accounts for the majority of cases reported from the northern region[3]. Mycetoma is more commonly reported in males than females (3:1), probably attributable to men being more commonly involved in agricultural work[20]. The condition is common in young adults (16-40 years) and is uncommon in children.

V. Case Description

A 27yr old male, driver by occupation, met with road traffic accident 4months back, sustained injuries on left side of chest, Left axilla and Left scapula. After 2 weeks, he noticed a small elevated lesion on the anterior axillary fold. Then, numerous small lesions appeared to involve mid & lateral axilla, let side of chest and left scapula and burst, leading to multiple discharging sinuses associated with itching. Later, there was discharge of pus and black colored granules from the sinuses. The movements of the shoulder and are were not restricted. (Fig:1&2)

Fig:1 Multiple discharging sinuses in the left axilla extending onto anterior chest wall.

Fig:2 Multiple lesions on posterior axilla extending on to left scapular region.

He was not a known case of Tuberculosis, HIV, Diabetes, and Hypertension.

Local Examination:

A diffuse swelling of 20 ×20 cm is seen in left axilla extending from 2 inches left of mid clavicular line from the anterior axillary fold and mid axilla to posterior axilla up to left subscapular region.

There was discharge of black colored granules from the sinuses. (Fig:3)

Multiple discharging sinuses with different stages of healing were seen. Hyperpigmentation surrounding the sinuses along with healed scars were noticed. (Fig:4)

Routine laboratory investigations were normal except high erythrocyte sedimentation rate (ESR).

Fig:3 Sinuses discharging black granules.

Fig: 4 Discharging sinuses with different stages of healing.

Microbiological Examination:

Sample: A few black granules in small gauze piece were sent to the Laboratory. (Fig:5)

The granules were back in color, spherical in shape and 1-2mm size with firm to hard consistency.

Fig:5 Black colored granules

Microscopy: The granules were crushed between two slides and 10% KOH Mount and LPCB mount were done.
KOH Mount showed mycelia of 1-5mm with moniliform hyphae and conidia. (Fig:6)
LPCB Mount showed branching septate hyphae with terminal swelling cells, chlamydospores. (fig)
Gram stain showed no bacteria (negative for Actinomycosis).

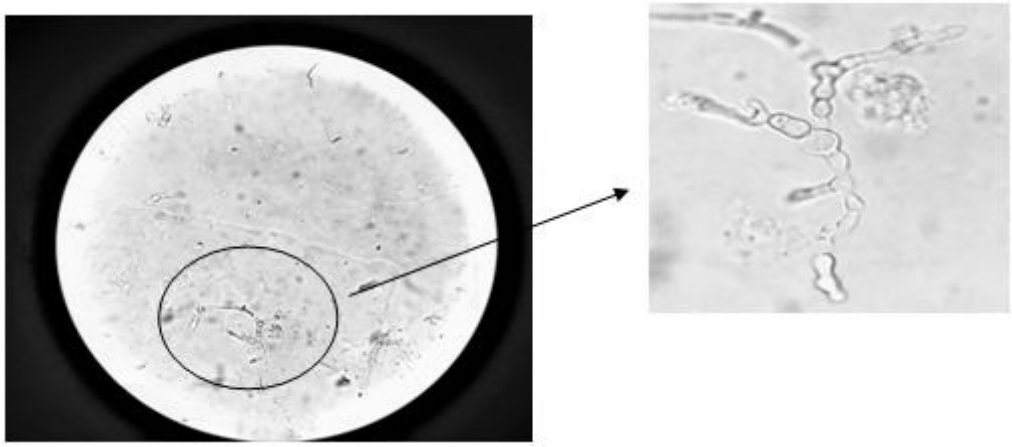
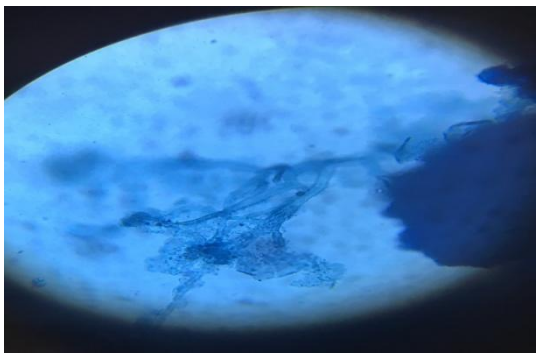
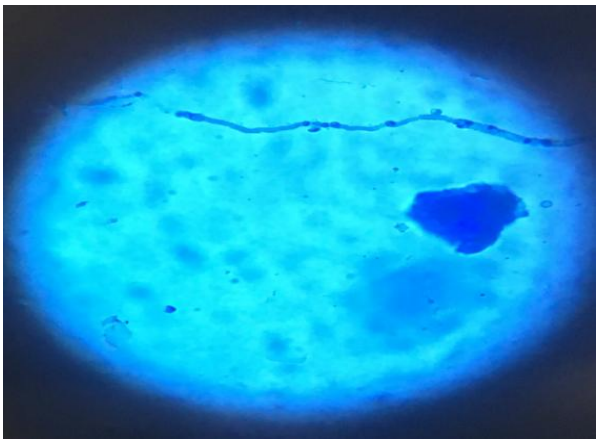


Fig:6 KOH Mount: shows mycelia of avg 1-5mm, with moniliform hyphae and conidia.





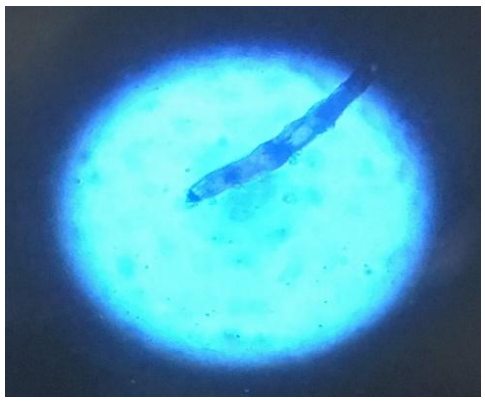


Fig:7,8&9 LPCB mount of Granules, shows Branching septate hyphae with terminal swelling cells, Chlamydospores.

Fungal Culture: The crushed granule was inoculated onto SDA and incubated for 4 weeks at 22^0 c in BOD incubator. (fig:10)
The surface of colony is raised to heaped, radially folded with glabrous to woolly structure; color white – yellow, while the reverse with production of brown diffusible pigment compared with control. [*Madurellamycetomatis*][19]
The growth was subjected to LPCB Mount. (fig:11)
Bacteriological Culture: A portion of granule was inoculated onto Blood agar and incubated anaerobically for 48hrs. No growth noticed - Sterile.

Histopathology report showed fibrillar filamentous organism surrounded by neutrophils, macrophages and giant cells suggestive of mycetoma of fungal etiology[7].

Fig:10 The surface of colony is raised to heaped, radially folded with glabrous to woolly structure; color white – yellow, while the reverse with production of brown diffusible pigment compared with control. [Madurellamycetomatis]

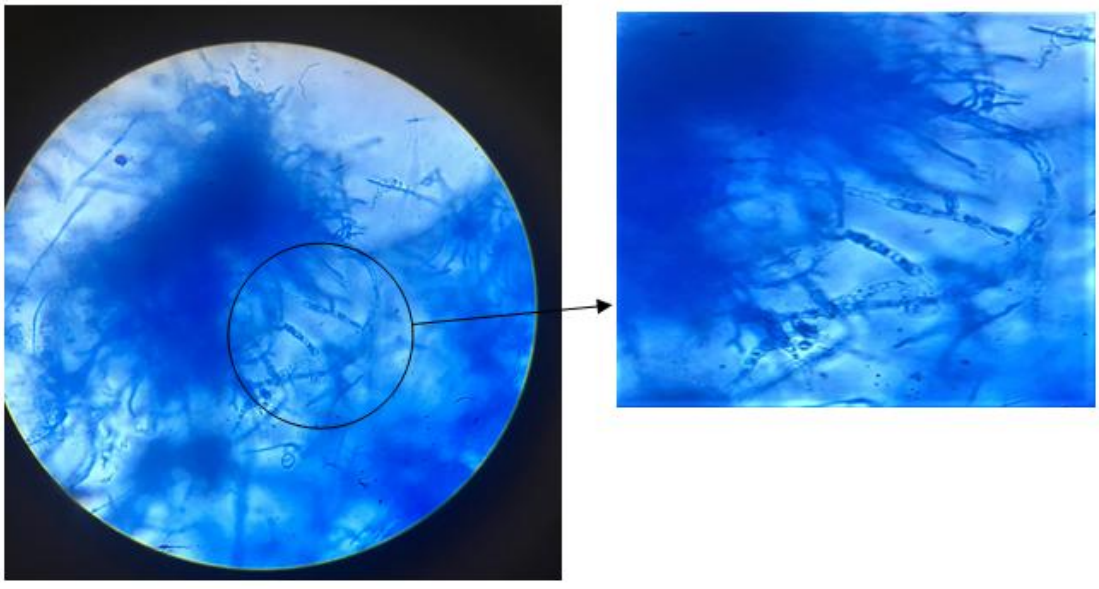


Fig:11 LPCB Mount of culture shows pigmented septate hyphae with intercalary chlamydospores characteristic of Madurellamycetomatis

Treatment:

Patient was started on antifungal drug, Itraconazole,400MG/DAY for 4 Weeks. He showed marked improvement with healed lesions after 4 weeks. (Fig:12&13)


Fig:12&13 Healed lesions after treatment.

VI. Discussion

Mycetoma is a chronic granulomatous inflammatory response involving bacteria or fungi that triggers the formation of grains containing aggregates of the causative Organisms that may be discharged onto the skin surfacethrough multiple sinuses, causing the progressive developmentof granulation and scar tissue that can cause deformity(Maiti et al., 2002)[13].In tropical countries, mycetoma is a real public healthissue. The type of mycetoma is often suggested by the color ofthe grains. Red grains are indicative of an actinomycotic mycetoma. Black grains are consistent with a eumycetoma,white and yellow colored grains are indicative of either Actinomycetoma or Eumycetoma (Ahmed et al., 2004)[1].

The differentiation between Eumycetoma and Actinomycetomais an important one with regard to therapy (Smith, E.L. et al 1998)[18]. The combination of the clinical specific lesions, typical grains and the histopathological appearance(presence of a granulomatous inflammatory reaction withabscesses containing granules of the infecting organism)is characteristic of the diagnosis.X-rays, tomography, and magnetic resonance imagingare all useful to determine the extension of the lesions in bone and other tissues (Elmaataoui et al., 2011)[5]. Initiation of treatment at an early stage is necessaryto prevent complication, as shown in our case (Lupi. et al., 2005)[11]. Combined medical and surgical treatment isthe standard to follow in mycetoma. The medical treatment consists of antibiotic therapy (Cotrimoxazole, Amikacin or Minocycline) for Actinomycetes or antifungal therapy(Ketoconazole or Itraconazole) for Eumycetoma(Mahgoub and Gumaa, 1984)[12]. In resistant cases of Eumycetoma,various antifungals (Terbinafine, Posaconazole, Voriconazole, Caspofungin and Anidulafungin) are indicated(Estrada et al., 2012)[6]. A prospective study showedthat Itraconazole in a starting dose of 400 mg then200 mg for the treatment of patients with mycetoma dueto *Madurellamycetomatis* is safe and well tolerated. And it is recommended to give Itraconazole in a high dose (400 mg) preoperatively to facilitate lesion localization by fibrosis (Fahal et al., 2011)[8].Surgery is indicated in mycetoma for resistance to medical treatment, better response to medical treatment in patients with massive disease or for localized lesions. The surgical options range from local excisions to amputations.Amputation is indicated in advanced mycetoma not responding to medical treatment with severe secondary bacterial infection (Smith and Kutbi, 1998)[18], hence the importance of earlier diagnosis and treatment.

VII. Conclusion

Madura foot is a chronic disease relatively rare in ourcountry. It is probably underestimated. However, it mightbe encountered in our practicing life. The dermatologist must be aware of this entity. Eumycetoma is a fungal diseasethat requires an early, accurate diagnosis. Medicaltreatment and surgical measures could be of great benefitfor these patients, a delayed diagnosis leading to functionaland aesthetical impairments[20].

Conflict of interest:

None.

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