



Pedal Mycetoma Mimicking Plantar Fibroma

Abdulkareem I H *, Tellisi N and Harris NJ

Department of Trauma and Orthopaedics, Leeds University Teaching Hospitals, Leeds, United Kingdom

Abstract

A 47-year-old female of African origin, presented with history of a growing lump on the sole of her right foot. She normally lives in the UK, but has been visiting an African country in the last few years. Physical examination showed an isolated nodular lesion on the sole of her right foot, at the instep with intact skin, and no sinus formation. The working diagnosis was a plantar fibroma. The patient was otherwise fit and well and was not on steroids or other medications. Physical examination revealed an isolated lump on the sole of her foot, with no other findings. Differential diagnoses considered include plantar fibroma, inter-metatarsal neuroma, subcutaneous lipoma, plantar fasciitis, aspergillosis, ganglion and warts among others. She had Ultrasound and later excision biopsy followed by histology which confirmed fungal Mycetoma. She made a recovery without any additional treatment and had no recurrence after two years of follow-up.

Keywords: Mycetoma; Plantar Fibroma; Pedal; Excision; Fungal; Bacterial; Ultrasound; Biopsy; Histology; Antibiotics; Antifungal

Introduction

Mycetoma is an uncommon condition that can affect any part of the body including the foot (Pedal Mycetoma). It is more common in warm tropical and sub-tropical countries where people walk barefooted, but a few cases have been described in the UK; with the incidence increasing due to worldwide travel and delayed diagnosis in some cases [1]. Majority of the literature regarding this condition is old and mostly comes from these developing countries, but Messoudi et al. recently published a series of fifteen cases of Madura foot in Morocco [2]. The organisms are normally present in the environment (soil and dust), and infection occurs in bare-footed persons after minor penetrating skin injury inoculating soil organisms, occurring preferentially in rural areas, usually among labourers who work barefooted [3].

Case Report

A 47-year-old female of African origin, presented with two year history of a growing lump on the sole of her right foot. She normally lives in the UK, but has been visiting an African country in the last few years. Physical examination showed an isolated nodular lesion on the sole of the right foot, at the instep with intact skin, and no sinus formation. The working diagnosis was a plantar fibroma. The patient was otherwise fit and well, with no history suggestive of immunosuppression. She was not diabetic and was not on steroids or other medications. Physical examination revealed an isolated lump on the sole of her foot, but other systemic examinations were negative for any findings. Other differential diagnoses considered include plantar fibroma, inter-metatarsal neuroma, subcutaneous lipoma, plantar fasciitis, aspergillosis, ganglion and warts among others.

An Ultrasound of the foot showed multiple small hypoechoic locules present in the subcutaneous fat overlying the plantar pleural cysts (Figure 1). The cysts measured between 3 and 5 mm in diameter and contained internal echoes and some linear hypoechoic areas. The ultrasound finding suggested a parasitic infection (Figure 1). Excision biopsy was performed and a fibro-fatty lump was analysed for histology (Figure 2). The lesion was located in the subcutaneous plane, with no local spread. This was excised completely, without breaching the plantar fascia. Histopathological analysis showed cellular nodules embedded in fibrous tissue composed of lymphocytes, macrophages and plasma cells (Figures 3-4 Haematoxylin and Eosin Staining). Centrally in the two nodules there were aggregates of fungal hyphae

associated with a neutrophilic inflammatory reaction (Figures 5,6 PAS Staining). Haematoxylin-eosin staining of the biopsy specimen revealed the presence of fungal grains, and the appearances of the lesion were those of Mycetoma (Figures 3-6). The specimen is normally processed by haematoxylin-eosin and May-Grünwald-Giemsa staining of a cytologic smear of a sample obtained via fine-needle aspiration or excision biopsy. Mycetoma grains can be distinguished from artifacts and other organisms by the intimate relationship between the grain and neutrophils. The appearance of the grains is as follows: Actinomycetoma - Homogenously eosinophilic with haematoxylin-eosin stain; blue in the center with pink filaments in the periphery with May-Grünwald-Giemsa stain, Eumycetoma - Brownish colour with haematoxylin-eosin stain; black with a green tinge with May-Grünwald-Giemsa stain [4]. Our patient made a good recovery after surgery, with no signs of recurrence after one year of follow-up.

Discussion

Mycetoma is a tropical infection that follows puncture wounds and

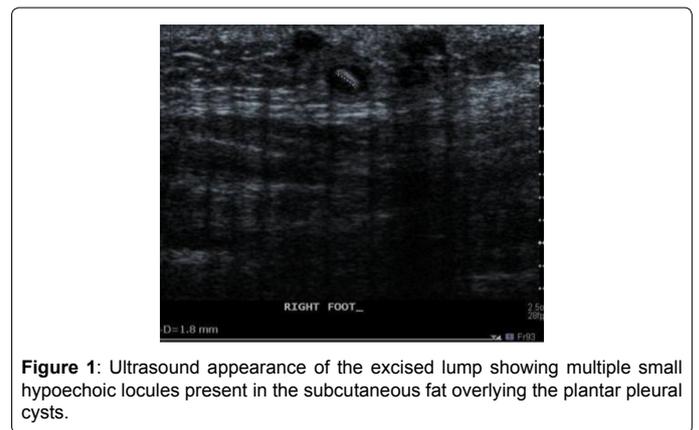


Figure 1: Ultrasound appearance of the excised lump showing multiple small hypoechoic locules present in the subcutaneous fat overlying the plantar pleural cysts.

*Corresponding author: Abdulkareem, Department of Trauma and Orthopaedics, Leeds University Teaching Hospitals, Leeds, United Kingdom; Tel: +44(0)7928531675; E-mail: imranharuna@yahoo.com

Received April 22, 2013; Accepted June 11, 2013; Published June 20, 2013

Citation: Abdulkareem IH, Tellisi N, Harris NJ. (2013) Pedal Mycetoma Mimicking Plantar Fibroma. *Orthop Muscul Syst* 2: 121. doi:10.4172/2161-0533.1000121

Copyright: © 2013 Abdulkareem IH, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

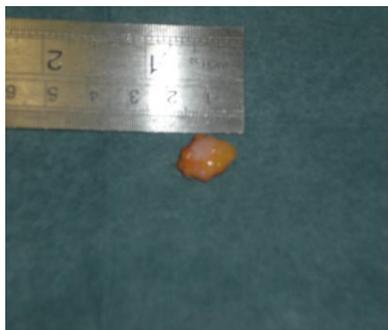


Figure 2: Macroscopic (gross) features of the excised fibro-fatty lump from the foot

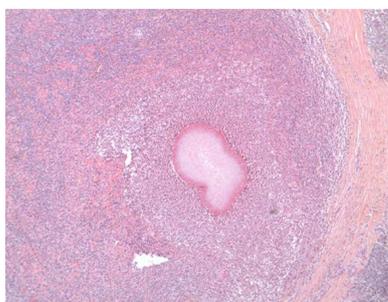


Figure 3: Haematoxylin & Eosin (H&E) staining of the specimen showing a granulomatous inflammation with a micro-abscess containing a granule.

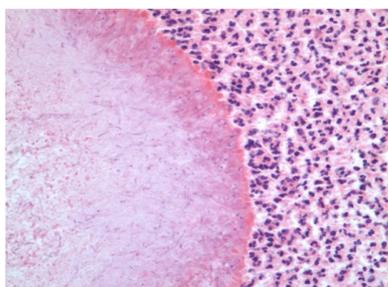


Figure 4: A closer view showing a granule within the micro-abscess

is typically encountered in patients aged 20-50 years, especially those who walk bare-footed [5]. The causative organisms of Mycetoma have geographical variations and can be bacterial (actinomycetoma) or fungal (eumycetoma) in origin [6]. The fungal (eumycetoma) organisms include *Madurella mycetoma*, *Madurella grisea*, and *pseudoalleschia*; while the actinomycetoma caused by higher bacteria include *Nocardia* species and *Streptomyces* species [1]. The lesion typically presents as a localised painless subcutaneous mass, draining sinuses and fungal grains consisting of Mycetoma, and when extensive and chronic it is referred to as Madura Mycosis or Madura foot. Pedal Mycetoma has been reported in up to 70% of the total cases known, commonly affecting the dorsal aspect of the forefoot [7]. Mycetoma affects soft tissues and bone through direct local spread; extra - pedal mycetoma can spread through lymphatics but this is reported to be rare [1].

The clinical features of mycetoma begin initially with a subcutaneous swelling, which becomes a nodule, with gradually increasing induration,

rupture, sinuses and discharge of fungal grains. There may be associated swelling and cellulitis of the affected limb, with or without systemic features, depending on the duration of the symptoms [4]. The diagnosis of this condition is mostly clinical especially in endemic countries where advanced cases are often encountered [8]. However, our patient presented early with a small subcutaneous lump on the sole of her foot, not associated with sinuses or discharge as in more advanced cases. The nodule was initially painless, but gradually became uncomfortable and interfered with walking as well as shoe wear.

Therefore, Ultrasound scan was used to expedite the diagnostic work-up and prepare the patient for surgery (Figure 1). MRI Imaging can also be helpful in establishing the diagnosis with dot-in-circle appearance; high intensity lesion on T2 images with a tiny central low-signal focus representing fungal grains within inflammatory granulomata [9,10]. This sign has also been described as a highly specific MRI and Ultrasonographic sign of Mycetoma [7]. Fungal stains can also be done through microscopy of any visible discharge. Cytology, Histology [11], Enzyme linked immunosorbent assay (ELISA), Immunohistochemistry, and DNA sequencing have also been successfully used [5].

The treatment of choice is surgical excision with wide margins, antifungal or antibiotic treatment following surgical excision is debatable as the results are variable [3]. Antifungal and antibiotic treatment can be used depending on the type of organism causing the lesion. For Actinomycetoma, combination therapy with trimethoprim-sulfamethoxazole, dapsone and streptomycin has been used. Rifampicin has been used in resistant cases [8]. Azole treatment is the recommended regime for small Eumycetoma lesions in the extremities [12]. *Madurella mycetomatis* may respond to ketoconazole, *P. boydii* (*S. apiospermum*) may respond to itraconazole. Other agents of Eumycetoma may respond

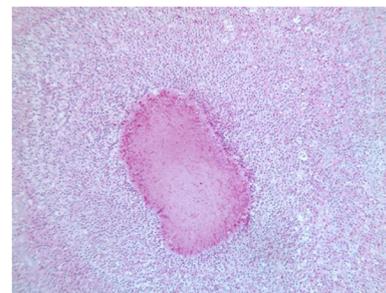


Figure 5: PAS staining of the specimen was positive (indicating that this is of fungal origin and not bacterial)

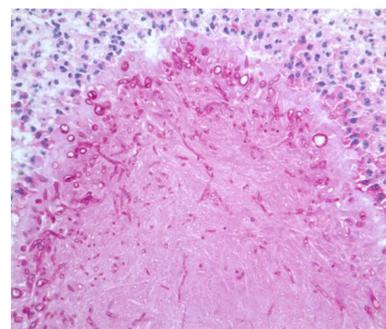


Figure 6: High power view of the PAS staining clearly showing fungal spores and hyphae.

intermittently to itraconazole or amphotericin B [13]. However, Agarwal and colleagues have recently described their experience of two different regimens of medical treatment for patients with actinomycetoma of the foot, and observed that the Ramam regimen was found to be very effective in treating such patients with only minimal bony involvement, while the Welsh regimen and its modification are suitable for more severe cases, because amikacin is more sensitive than gentamicin in the treatment of resistant organisms. The modified Welsh regimen can also be continued for five cycles when there is more extensive bony involvement [14].

In our patient, Ultrasound was used as the modality of imaging and was successful in obtaining a valid diagnosis without much delay (Figure 1). Therefore, in our view this is comparable to findings reported by MRI scan, which is more expensive and may take time to organise. The lesion was an isolated nodule, and was excised with a wide margin, and no sign of local infection spread (Figure 2).

We opted not to use antifungal or antibiotic treatment following surgical excision due to the complete resolution of symptoms, and absence of recurrence after two years [15]. This case highlights the fact that mycetoma may occur anywhere due to frequent travel around the world and increasing migration from endemic areas.

References

1. Hepple S, Harris N, Smith TWD (1997) Madura Foot. *The Foot* 7: 176-179.
2. Messoudi A, Fnini S, El Andaloussi Y, Charafeddine A, Marouane S, et al. (2013) [Madura foot: a rare pathology in Morocco (about 15 cases)]. *Bull Soc Pathol Exot* 106: 9-12.
3. Fahal AH, Hassan MA (1992) Mycetoma. *Br J Surg* 79: 1138-1141.
4. Palestine RF, Rogers RS 3rd (1982) Diagnosis and treatment of mycetoma. *J Am Acad Dermatol* 6: 107-111.
5. Venkatswami S, Sankarasubramanian A, Subramanyam S (2012) The madura foot: looking deep. *Int J Low Extrem Wounds* 11: 31-42.
6. Rattanavong S, Vongthongchit S, Bounphamala K, Vongphakdy P, Gubler J, et al. (2012) Actinomycetoma in SE Asia: the first case from Laos and a review of the literature. *BMC Infect Dis* 12: 349.
7. Sen A, Pillay RS (2011) Case report: Dot-in-circle sign - An MRI and USG sign for "Madura foot". *Indian J Radiol Imaging* 21: 264-266.
8. Ania BJ, Asejo M, Kiel RJ (2008) Mycetoma Mycetoma, eMedicine.
9. Sarris I, Berendt AR, Athanasous N, Ostlere SJ; OSIRIS collaborative study group (2003) MRI of mycetoma of the foot: two cases demonstrating the dot-in-circle sign. *Skeletal Radiol* 32: 179-183.
10. Jain V, Makwana GE, Bahri N, Mathur MK (2012) The "dot in circle" sign on MRI in maduramycosis: a characteristic finding. *J Clin Imaging Sci* 2: 66.
11. Chufal SS, Thapliyal NC, Gupta MK (2012) An approach to histology-based diagnosis and treatment of Madura foot. *J Infect Dev Ctries* 6: 684-688.
12. Ahmed AA, van de Sande WW, Fahal A, Bakker-Woudenberg I, Verbrugh H, et al. (2007) Management of mycetoma: major challenge in tropical mycoses with limited international recognition. *Curr Opin Infect Dis* 20: 146-151.
13. Lexier R, Walmsley SL (1999) Successful treatment of Madura foot caused by *Pseudallescheria boydii* with *Escherichia coli* superinfection: a case report. *Can J Surg* 42: 307-309.
14. Agarwal US, Besarwal RK, Gupta R, Agarwal P (2012) Treatment of actinomycetoma foot - our experience with ten patients. *J Eur Acad Dermatol Venereol*.
15. Oddy MJ, Blundell CM, Suvarna SK, Greig JM (2009) Mycetoma of the foot. *Br J Hosp Med (Lond)* 70: 658.