More Than Just a Swelling: A Pathologist’s Perspective

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Abstract

Deep mycosis is commonly seen in immunocompromised individuals and rarely in immune competent patients but they have increased morbidity and mortality. These cases, when they present as skin lesions or subcutaneous swellings, are often misdiagnosed as sebaceous cyst or soft tissue tumors and the patients are often not treated properly. Here, we would like to present a series of deep mycosis cases which were clinically misdiagnosed as soft tissue lesions/tumors and the importance of fine needle aspiration cytology and diligent histopathological examination to aid in the proper care of patients.

Key Words– Swelling, Abscess, Granulomatous Inflammation, Special stains, Deep mycosis


Introduction

Cutaneous deep fungal mycosis are infrequently encountered in routine clinical practice. These infections usually develop after a penetrating injury that leads to inoculation, implantation of organism or inhalation of the spores from contaminated soil and are more prevalent in tropical regions especially in immunocompromised patients. Most often these lesions present as painless swelling, nodule, ulcer or sinuses, thus commonly

misdiagnosed as skin or soft tissue tumours clinically.\textsuperscript{[6]} Though cultures are considered the gold standard for diagnosis, they are often negative and histopathology is sometimes the only diagnostic tool available. In this study we share our experience of deep mycoses presented as soft tissue lesions or tumours clinically.

**Case details** are shown in Table 1

**Discussion**

Deep mycosis is uncommon, rarely encountered in medical practice. Mycetoma, a localised chronic suppurative/granulomatous inflammatory lesion, characterised by swelling, discharging sinuses and granules.\textsuperscript{[1]} Maduramycosis, first described in India, can be caused by microaerophilic actinomycetes called as Actinomycetoma, as well as fungi termed as Eumycetoma.\textsuperscript{[1,3]} Trauma results in inoculation of the organism especially in agricultural workers or those who walk barefoot. Most common site is the foot.\textsuperscript{[1,3]} Eumycetoma showssinuses with yellow or dark discharging granules, thick septate hyphae while actinomycotic mycetoma is more destructive, white discharging granules and shows Splendore-Hoeppli phenomena, clumps of basophilic bacteria in rosette like pattern, fine branching filaments.\textsuperscript{[1-4]} Special stains like Ziehl-Neelson (for actinomycetes), GMS and PAS must be done to differentiate the causative agent. The condition is usually not fatal but causes severe deformity and decreases the quality of life. Differential diagnosis includes cutaneous tuberculosis,\textsuperscript{[4]} chronic fistulated osteomyelitis and soft tissue sarcoma.\textsuperscript{[1-4]} Our case was clinically presented as swelling with discharging sinuses with yellow granules.

Phaeohyphomycosis, caused by melanin containing fungi known as phaeoid or dematiceous fungi, can involve skin, subcutaneous tissue, systemic and invasive forms.\textsuperscript{[2,6,7]} Subcutaneous form being the common presentation, often known as phaeohyphomycotic cyst. Clinically present as circumscribed mobile fluctuant nodule. Hence it is clinically misdiagnosed as sebaceous cyst, ganglion cyst or lipoma.\textsuperscript{[5, 6]} In our scenario also cases were clinically misdiagnosed as sebaceous cyst as well as ganglion cyst, two of which had immunosuppressive conditions and one had a history of trauma. Histologically, subcutaneous form presents as pseudocystic space lined by granulation tissue, giant cell reaction along with hyphal fungal elements. Two cases were diagnosed by Fine needle aspiration cytology (FNAC). FNAC is a simple, easy to perform, quick diagnostic method which can be used to make preoperative diagnosis and helps in complete excision which prevents recurrences and tissue can be sent for culture for species identification.

Aspergillus otitis media is extremely rare, especially in immunocompetant patients. It is angioinvasive, invades into deeper structures and has a high fatality rate. They are seen as septate hyphae with dichotomous branching.
at 45 degree angles.\cite{8,9} A degree of suspicion must be present when a patient, especially one with immunocompromising conditions, presents with otorrhea or mass in the auditory canal that does not respond to usual treatments with antibiotics. Deep mycosis in the ear can clinically masquerade as malignancy, so biopsy with proper histopathological interpretation is indispensable.

In conclusion, fungal infections can mimic skin or soft tissue neoplasm clinically. In the presence of granulomatous tissue reaction with abscess rich in neutrophils, eosinophils and foreign body giant cells, special stains are imperative to rule out fungal infection. Thus, morphology coupled with special stains and careful search for the elusive culprit, aids in the diagnoses of cutaneous deep fungal infections. This also highlights the importance of FNAC, which will hasten the diagnosis and will direct the path for proper surgical and medical management, as lack of clinical suspicion may result in these swellings not undergoing histopathological examination.

References


Legends

Figure 1 a: Clinical images showing swelling with discharging sinuses. b: MRI of left foot showing heterogenously enhancing soft tissue lesion extending from plantar surface to dorsum of midfoot without involvement of contiguous metatarsals bones. c: Gross specimen shows nodule with multiple sinuses showing yellow discharging granules. d: shows sulphur granules with septate fungal hyphae (Hematoxylin & Eosin 20x). e: Periodic Acid Schiff (PAS) stain highlighting the septate hyphae (40X). f: GMS stain highlighting the fungal hyphae (40x).

Figure 2 a: Pseudocyst, granulomatous tissue reaction, abscess admixed with histiocytes, neutrophils, eosinophils, foreign body giant cell, and branching septate hyphae (H&E 20x). b: PAS stain highlighting the septate fungal organism (100x). c: FNAC Papainicolaou stain showing fungal hyphae within the giant cell. d: Shows fungal hyphae acute angle branching along with keratin and bony fragments (H&E, 40x).

Table 1: Case details

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Clinical Presentation</th>
<th>Gross Findings</th>
<th>Microscopic Findings</th>
<th>Impression</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Left foot swelling with multiple discharging sinuses - ? soft tissue sarcoma/ ? mycetoma</td>
<td>Two nodular tissue bits grey white areas and yellow cystic areas filled with grey brown material. [Figure 1a]</td>
<td>Granulation tissue, abscess composed of lymphocytes, plasma cells, histiocytes admixed with neutrophils along with granuloma, giant cells and sulphur granules showing septate fungal hyphae.</td>
<td>Eumycetoma (fungal mycetoma)</td>
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<td></td>
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<td>PAS,GMS* – highlights fungal hyphae</td>
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<tr>
<td>3</td>
<td>Right leg</td>
<td>History of diabetes mellitus and chronic kidney disease - ?</td>
<td>Sebaceous cyst</td>
<td>Single skin covered tissue measuring. Cut surface: focal grey yellow areas seen.</td>
</tr>
<tr>
<td>4</td>
<td>Cystic swelling on right leg</td>
<td>History of trauma present. ? Sebaceous cyst</td>
<td>Single skin covered tissue with underlying cystic space measuring filled with pultaceous material.</td>
<td>Pseudocystic space lined by granulation tissue, foamy histiocytes, multinucleated giant cells, neutrophils. PAS, GMS – highlights fungal hyphae.</td>
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<tr>
<td>5</td>
<td>Swelling on lateral aspect of right foot - ?</td>
<td>Ganglion cyst</td>
<td>Skin covered globular tissue. Cut surface: grey white to grey yellow with a cystic space.</td>
<td>Dermis &amp; subcutaneous tissue showed pseudocystic space with fibrin, lined by acute on chronic inflammatory granulation tissue, foreign body giant cell reaction, granulomatous inflammation, foamy macrophages with septate fungal hyphae.</td>
</tr>
</tbody>
</table>

|   | 6 | Sebaceous cyst for 4 months | Cut open cystic structure. Cut surface: cystic space filled with grey brown material. | Pseudocystic space lined by palisading histiocytes filled with abscess, multinucleated giant cells with branching septate hyphal fungal elements. PAS,GMS – highlights fungal hyphae | Phaeohyphomycosis |
|   | 7 | Tumor in the auditory canal for 6 months. | Multiple grey white firm tissue bit with few bony fragments | Tissue fragments, some lined by stratified squamous epithelium with focal ulceration, granulation tissue, foreign body giant cell reaction, keratin flakes. Areas of necrosis, necrotic bony spicules with balls of fungal elements composed of septate hyphae with acute branching, angioinvasion noted. GMS – highlights fungal hyphae. [Figure 2d] | Fungal otitis with osteomyelitis. Morphology suggestive of aspergillus species |

*PAS – Periodic Acid Schiff, GMS - GrocottMethamine Silver stain

Figure 1