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CYTODIAGNOSIS OF PRIMARY CUTANEOUS ASPERGILLOSIS – A CASE REPORT

Dr. Suwarna Patil[1], Dr. Ashish Shinde[2], Dr. Swarada Kangate[3], Dr. Dilip Sarate[4]

[1]Associate Professor, [2,3] Assistant Professor, [4]Professor and Head

[1]Department of Pathology, Government Medical College, Akola, Maharashtra, India

Abstract: Cutaneous Aspergillosis is a rare disease. It may be either primary or secondary infection. Aspergillus species is the most ubiquitous fungi. Mostly occurs in immuno-compromised patients, diabetics and patients on corticosteroids, with very rare reports in the literature of primary cutaneous Aspergillosis in immunocompetent individuals.[1,2] In this case report, we describe an unique case of primary cutaneous Aspergillosis in a non-covid, diabetic patient diagnosed by fine needle aspiration cytology (FNAC). FNAC techniques are safer, cost-effective and give rapid results. Early diagnosis and awareness of multiple aetiologies for skin lesions will help in prompt and correct treatment.

Keywords: Cutaneous Aspergillosis, Fine needle aspiration cytology, Culture, Diabetic.

1. Introduction:

Cutaneous Aspergillosis is a rare disease. It may be either primary or secondary infection. In primary cutaneous Aspergillosis, the lesion occurs with the direct inoculation of spores at the site of injury following intravenous catheter, trauma, occlusive dressings and tapes, burns or surgery. While in secondary cutaneous Aspergillosis, it occur due to haematogenous dissemination from a primary focus such as the lungs or to contiguous spread to the skin from underlying infected structures. Most common Aspergillus species causing primary cutaneous Aspergillosis are Aspergillus flavus, Aspergillus fumigates, Aspergillus niger, Aspergillus terreus and Aspergillus ustus.[1] Mostly occurs in immuno-compromised patients, diabetics and patients on corticosteroids, with very rare reports in the literature of primary cutaneous Aspergillosis in immunocompetent individuals.[1,2] In this case report, we describe an unique case of primary cutaneous Aspergillosis in a non-covid, diabetic patient diagnosed by fine needle aspiration cytology (FNAC).

2. Case:

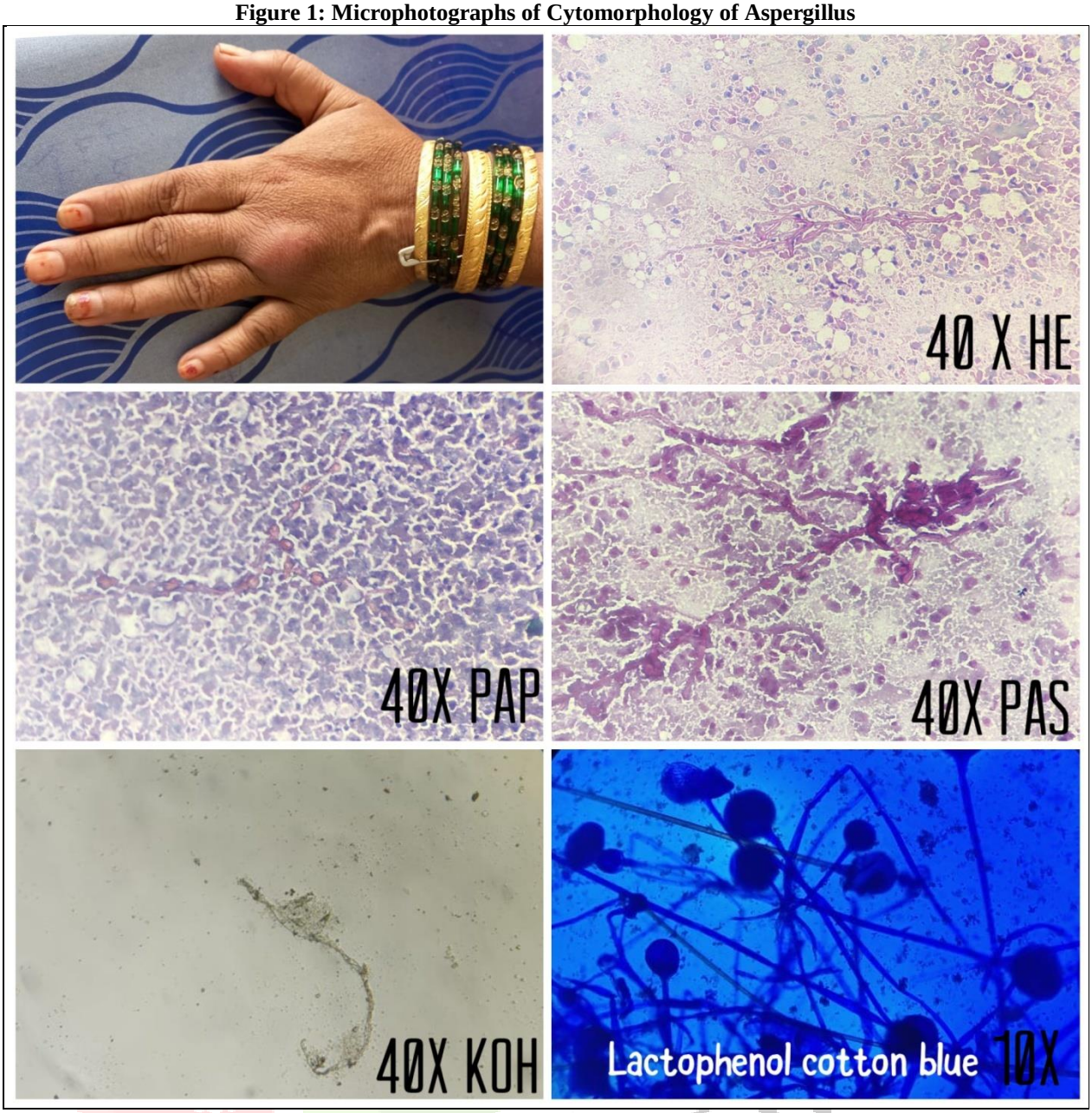
A 45-year-old female, farmer by occupation, presented with a swelling over dorsal aspect of left hand, near index finger, which had appeared 8 months back. There was no history of trauma or any invasive procedure. Examination revealed an erythematous nodule 3x2 cm in size on the left hand. The nodule was soft to cystic in consistency, slightly tender and not fixed to the underlying structures. There was no history of Koch's, fever or cough. She was a known case of diabetes mellitus. Routine laboratory investigations were within normal limits. The case was clinically diagnosed as subcutaneous abscess and FNAC was performed.

On aspiration purulent material was obtained. Multiple slides were prepared and stained with Hematoxylin and eosin (H&E), Papanicolaou (PAP) and May-Grunwald (MGG). Special stain Periodic acid –Schiff (PAS) was also performed. Cytological examination of the multiple smears studied revealed adequate cellularity consisting of abundant necrosis, plenty of eosinophiles, neutrophils, lymphocytes and fungal balls and colonies showing acute angle branching, septations and fungal spores. These fungal colonies showed features of Aspergillosis.

Direct examination of the aspirate in 10% KOH showed the presence of hyaline, septate hyphae and large number of spores. Gram stain showed the absence of bacteria and Ziehl– Neelsen (ZN) stain was negative for acid-fast bacilli (AFB).

Lactophenol cotton blue staining showed sporangium with broad aseptate hyphae. (Fig 1)

Figure 1: Microphotographs of Cytomorphology of Aspergillus



The aspirate was inoculated on Sabouraud Dextrose Agar (SDA) with and without gentamycin. Pure growth of moderately fast growing, white, cottony-wooly colony with black spores (salt and pepper appearance) was obtained. (Fig 2)

3. Discussion:

Aspergillus species is the most ubiquitous fungi. It exists in soil, water and decaying vegetations. There are over 350 species of Aspergillus that are widely distributed in nature, but only a few are pathogenic to man. A. fumigatus and A. flavus are the offenders in systemic infections. Cutaneous Aspergillosis is mostly caused by A. flavus and A. fumigatus and rarely by A. niger, A. terreus, A. ustus, and A. chevalieri. Clinically, the lesion is characterized by violaceous macules, papules, plaques, subcutaneous nodules, haemorrhagic bullae, ulcerations with central necrosis and pustules or subcutaneous abscess.[1] It is commonly seen in patients suffering from malignancies, diabetes, in patients who are on long-term corticosteroids and immunocompromised state.[3] In immunocompromised patients, the infection is disseminated in the blood. Reports of primary cutaneous Aspergillosis are rare. An increase in the prevalence of the disease has been noticed since the 1970s as a result of the ever increasing spectrum of immunocompromised patients. Initially the disease is reported in neutropenic hosts, occurring mainly in neonates, burns cases, patients undergoing intensive chemotherapy, organ transplant recipients and HIV patients.[1] Fungal granulomas has been reported in immunocompetant indiviuals of Pakistan, Sudan and India. They are usually not seen in the Western Worlds. Mode of entry of Aspergillosis includes respiratory tract, cornea, infected and damaged wounds. Inhaled spores provokes hypersensitivity reaction and cause allergic bronchopulmonary Aspergillosis and is associated with increase in serum IgE levels.[2] Immunocompetent patients usually involves sites of skin injury e.g. intravenous access catheter sites, traumatic or surgery wounds, occlusive dressings used in burns cases, with mostly a favorable outcome. Diagnosis of cutaneous Aspergillosis requires skin biopsy. Histopathological examination with routine H&E and special fungal stains such as Gomori methanamine silver and PAS stains would detect the presence of acute-angled branching, septate hyphae and at times fruiting structures namely heads and conidia of Aspergillus species.[1] However, our case has been diagnosed by FNAC. Cytological diagnosis is a well-known method for differentiation of infective lesions from neoplastic lesions and an important tool for the diagnosis of mycotic infections.[4,5]

Figure 2: Photograph showing Culture growth of Aspergillus

Multinucleate giant cells outnumbering the epitheliod cell granulomas and predominance of eosinophils are clues for the cytologist to search for a fungus.[6] Cheetham had reported a case of subcutaneous infection due to A. terrus where the pus from the lesion contained structures resembling spherules. However, culture of the spherules yielded no growth and no progressive lesions developed on animal inoculation. Hence, the spherules were reported to be not related to Aspergillus.[7] Treatment of cutaneous Aspergillosis included a combination of surgical debridement and antifungal drugs. Potassium iodide, ketoconazole, Itraconazole and voriconazole have been tried, with varying results. Prognosis of the disease, entirely, depends on the underlying illness.[8]

4. **Conclusion:**

Primary cutaneous Aspergillosis in immunocompetent individuals usually has a favourable outcome. The case is being presented to increase the awareness of the clinicians and pathologists that primary cutaneous Aspergillosis could present as infected subcutaneous nodule and can be accurately diagnosed by FNAC. Though culture is a gold standard, colonies grow after 48hrs but longer period may be required before characteristically morphological features develop, also, aspergillus species are ubiquitious and hence fungal colonies may contaminate cultures. Due to these limitations, cytomorphology plays a major role in an accurate diagnosis. FNAC techniques are safer, cost-effective and give rapid results. Use of special stains to enhance cytomorphological changes in conjunction with microbiology culture result is critical to identify the specific microorganism. Early diagnosis and awareness of multiple aetiologies for skin lesions will help in prompt and correct treatment.

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