

A Study on Spectrum of Fungal Lesions in Aspiration Cytology

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Abstract: Mycotic infections are on the rise globally. Fine needle aspiration is a simple technique that can be useful for early diagnosis of fungal lesions at various sites. In this study, we have analysed retrospectively the spectrum of fungal lesions diagnosed on fine needle aspiration cytology over a period of 1 year in a government tertiary care hospital. 33 fungal lesions from different sites diagnosed by fine needle aspiration cytology were selected and their clinical details were recorded. The age of patients ranged from 31 to 80 years and there were 19 males and 14 females. Majority of the lesions were situated in the extremities and had history of minor trauma. Few cases had history of organ transplant and steroid intake. All aspirates were cellular and in most cases fungal hyphae were detected on initial examination. Smears showed inflammatory cells with foreign body giant cells. Majority of the lesions about 28 cases (85%) found to have definitive morphology and remaining 5 cases (15%) typing could not be made, yet fungal hyphae was highlighted in special stains and confirmed by culture and histopathology. Search for fungus should be done aggressively in smears with many foreign body giant cells and inflammatory cells. Preoperative cytological diagnosis obviates the need for biopsy, saves time and helps to plan proper treatment.

Keywords: fine needle aspiration cytology, fungal lesions, phaeohyphomycosis, organ transplant recipients, steroid intake.

INTRODUCTION

The incidence of the fungal lesions is on the rise over the past few decades. Fine needle aspiration cytology is an easy, reliable and minimally invasive method to diagnose and categorize the various fungal lesions in the body for early and definitive treatment [1].

In this study, we have analyzed retrospectively the spectrum of fungal lesions diagnosed on fine needle aspiration cytology over a period of 1 year in a government tertiary care hospital.

METHODS

The retrospective study was conducted in the Institute of Pathology, Rajiv Gandhi Government General Hospital, and Chennai for a period of one year from November 2016 to November 2017. For this study, 33 cases of fungal lesions (superficial and deep) from different sites diagnosed on fine needle aspiration cytology were selected and their retrospective medical records were noted. Patients who were diagnosed in other hospitals and receiving treatment in this institute were excluded.

All the cases had detailed clinical history which included age, gender, site, predisposing factors mainly history of trauma (thorn prick), imaging findings and clinical symptoms and signs with physical examination findings. The aspirated smears which showed positive for fungal hyphae were confirmed by histopathology, special stains and culture. All the collected details were then analyzed.

RESULTS

33 cases of various fungal lesions were studied over a period of 1 year from November 2016 to November 2017.

Of these, majority of the lesions (73%) were occurred in the 31-60 age group, 21% in 61-70 age group and remaining 6 % in the 71-80 age groups (TAB:1).

Table-1: Incidence of fungal lesions according to age range

Age group (in years)	No of patients-posititve for fungal lesions	Incidence of fungal lesions (in %)
31-60	24	73%
61-70	7	21%
71-80	2	6%

Of these, majority of the patients (about 19 patients) were males and 14 were females.

About 28 lesions (85%) were in the upper and lower limbs with 13 in upper limbs and 15 in lower limbs, with majority of the lesions situated in the extremities like hand and foot, with 10 lesions were in foot and 9 lesions in hand. 3 (9.09%) cases were found to be nasal mass and one from lung mass and lower abdominal wall mass (TAB: 2).

Table-2: Fungal lesions and sites

Sites of fungal lesion	No of cases	Incidence (in %)
Lower limbs	15	46%
Upper limbs	13	39%
Nasal mass	3	9%
Lung mass	1	3%
Lower abdominal wall mass	1	3%

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Among these 33 cases, 11 (33.33%) cases had history of minor trauma, following which patients developed swelling and most of them had phaeohyomycosis (FIG 4 & 5).

4 (12%) patients were found to be immunocompromised, of which one patient had renal transplant before and found to have cryptococcal (FIG 3) infection.

Among these 33 cases, 23 (70%) superficial cutaneous mycotic lesions, 6 (18.1%) subcutaneous mycotic lesions and 4(12.1%) deep mycotic lesions were found out.

Among the fungal lesions, 24(73%) patients were found to have phaeohyomycosis ,4(12%) patients were found to have fungal abscess and remaining 5 (15%)patients found to have aspergillosis, mucormycosis, cryptococcosis and rhinosporidiosis respectively.(fig : 1).

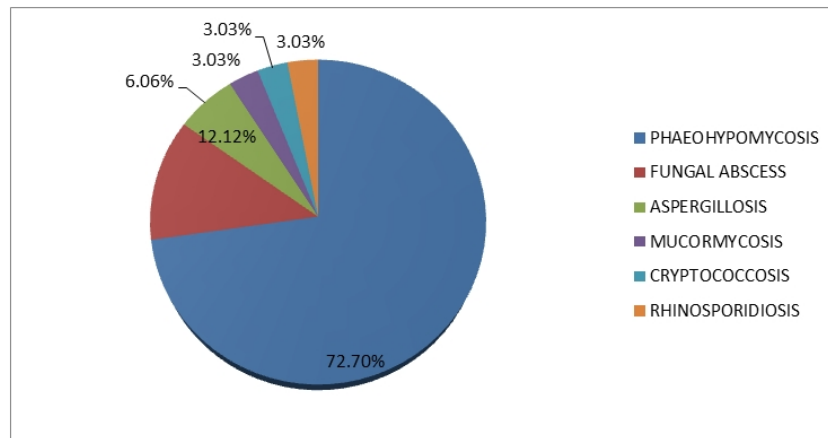


Fig-1: Fungal lesion

Among the 3 nasal masses, one case of rhinosporidiosis(FIG 2), aspergillosis (FIG 7)and mucormycosis(FIG 6) were identified. And one lung mass which was aspirated through USG guidance showed aspergillosis.

All smears with positive fungal hyphae were confirmed by periodic acid Schiff(PAS) and Gomori's methamine silver (GMS) stains and culture and were confirmed by histopathology.

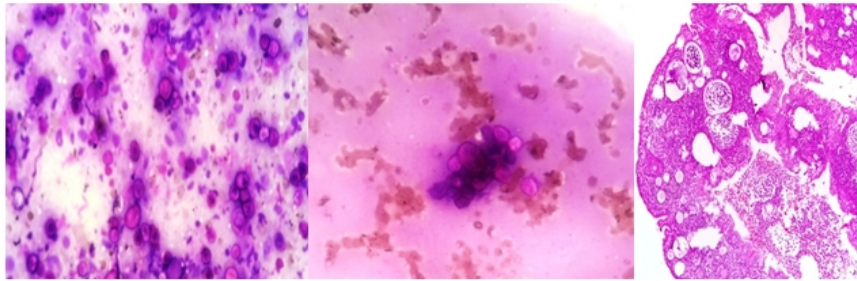


Fig-2: cytology mgg – 100 x cytology pas- 100x biopsy h&e 400x rhinosporidiosis

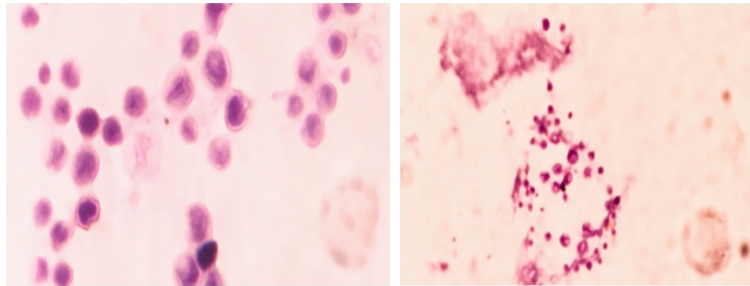


Fig-3: H&E 1000x PAS 100X cryptococcosis

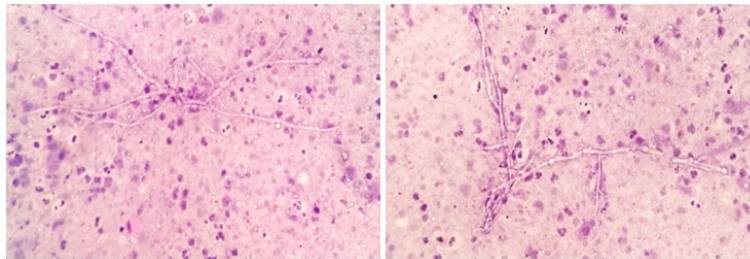


Fig-4: cytology H & E 100 X – unstained refractile fungal hyphae

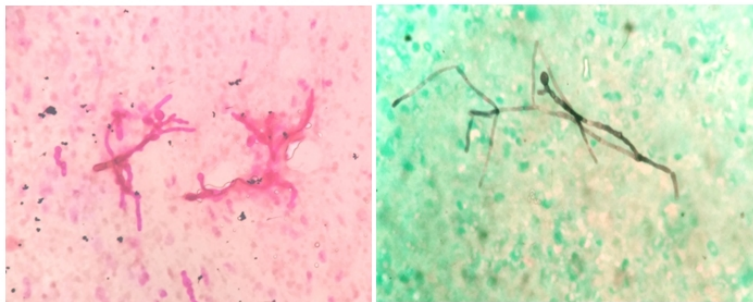
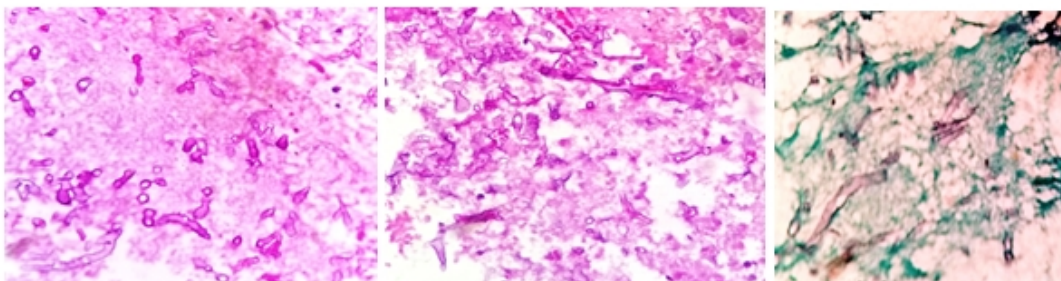


Fig-5: cytology: PAS- 100X Cytology GMS- 100 X pigmented fungi with beaded appearance- phaeohyphomycosis



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Fig-6: H & E- 400 X –Biopsy pas 400x gms 400x shows broad aseptate hyphae with obtuse angle branching- mucormycosis

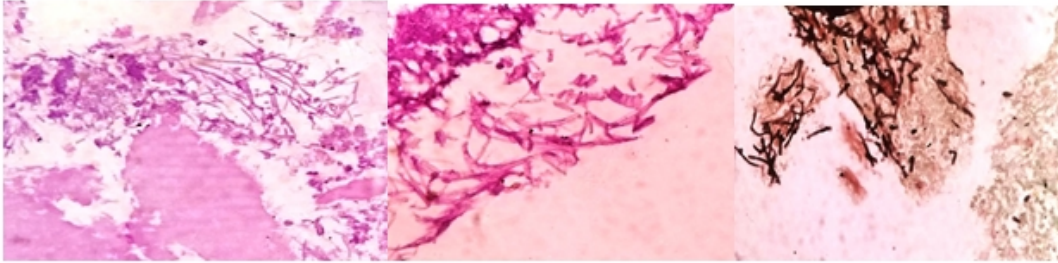


Fig-7: H&E 400X PAS 100X GMS 100X

Shows slender, septate, acute angle branching fungal hyphae – aspergillosis

DISCUSSION

Mycotic lesions are on the rise globally due to the indiscriminate use of broad spectrum antibiotics, increase in the number of immunocompromised patients, travel and environmental exposure. Fine needle aspiration cytology has emerged as a well-established diagnostic modality for identification of the fungal infections [2].

The role of cytopathology in diagnosing common fungal infections in modern era is very much important in view of its rapidity and reduced turnaround time useful for treatment purposes. The common problems in cytological specimen is degeneration, shearing and cell distortion as well as drying artefact which is avoided by rapid stains after immediate fixation. Most fungi are diagnosed on cytology specimens by their morphology rather than staining properties.

The most common clue and observation to diagnose fungal infection is necrotic material admixed with acute inflammatory response [3]. The most common fungal infection encountered by us in our study is Phaeohyphomycosis.

Infections by the dematiaceous fungi are an emerging group of infectious diseases worldwide with a variety of clinical presentations. Most of the lesions are generally localised, while few can disseminate in immunocompromised settings [4].

The term “Phaeo” comes from the Greek meaning “dark” and therefore, “phaeohyphomycosis” means infection caused by dark walled fungi. “Melanized” and “dematiaceous” are used as well. Melanin in the cell wall is implicated as a virulence factor. These fungi are ubiquitous in the environment, inhabiting living and dead plant material and soil. Infection usually results from traumatic implantation, but in many cases this history is not easily evident as it is very trivial [5]. Microscopy showed septate fungal hyphae with budding and branching and shows brown pigments in a background of necroinflammatory cell infiltrates are identified.

Fungal sinonasal sinusitis constitutes about 6-9% of all rhinosinusitis. Aspergillosis and mucor are the most common non-invasive and

invasive fungal infection of the head and neck region. Both can pose diagnostic challenge in view of mimics as malignancy. The mode of entry includes respiratory tract, damaged skin or operated wounds, cornea and ear. Aspergillosis is a filamentous structure, with septate hyphae and branching at acute angles. Mucor has a broad, aseptate hyphae branching at right angles. Special stains like PAS and GMS may be helpful for fungal hyphae [6].

The other most important organism encountered is Cryptococcus infection. Cryptococcus's is a severe fungal infection with a high mortality rate among solid organ transplant recipients [7]. Here in our case the patient presented with nodules in left arm and right thigh for 3 months. Microscopy showed numerous spherical yeast of variable sizes with occasional budding forms surrounded by a clear halo suggestive of capsule in a necrotic background. Thick capsule was demonstrated on India ink preparation [8].

Fungal cultures though gold standard and complimentary to morphology and species identification has long turnaround time that leads to lack of follow up of patients.

CONCLUSION

Fungal infections diagnosed on cytology requires high index of suspicion. All smears with necrotic background should be thoroughly searched for fungus, as FNAC is always helpful in view of its simple outpatient and less invasive procedure with little discomfort to the patient. Morphological diagnosis of fungal infections by cytology is not intended to reduce microbiological confirmation; instead of it will help in rapid and initial diagnosis and safe, cost effective method for the patients, clinicians and cytopathologists.

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