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Case Report

Chronic Granulomatous Fungal Disease Masquerading as Breast Cancer in Port Harcourt, Nigeria: A Case Report and Literature Review

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Abstract

Background: Extracutaneous or deep-seated mycosis of the breast tissue is rather rare, however, it has been described in some parts of the world. Available evidence suggested that a decline in reporting might imply neglect or a low index of suspicion. The aim of this study was to report the features of unusual chronic granulomatous fungal disease that presented to our health facility with features of breast cancer in the first half of year 2025. *Case Presentation:* A 37 year-old breast-feeding mother who presented to General Surgery Outpatient Clinic on referral from a health center with a history of left breast lump of 5 months duration. She had fever at the onset of the illness, associated with breast pain. The swelling had progressed to form multiple "boil" which ruptured and discharged some relatively clear fluid with associated changes in the skin and thickening of the left breast. There were no other remarkable symptoms. She had had antibiotic treatment and a biopsy taken before referral. Significant findings on physical examination included: gross breast asymmetry with the left breast being bigger, showed hyperemic areas, serous discharge, peau de orange with irregularly shaped scar (previous biopsy scar). There was a mass located in the outer upper and inner upper quadrant, measuring 6cm by 8cm with surrounding discharging sinuses. The breast ultrasound scan revealed left-sided complex heterogenous solid mass 5.4cm x 3.5cm with irregular outline; the left axillary lymph node was enlarged and measured 3.2cm x 1.8cm. The tissue histopathology report of Tru Cut biopsy revealed Chronic non-specific/mastitis idiopathic granulomatous mastitis. *Conclusion:* The symptoms and signs of breast cancer and breast mycosis share some similarities. Breast fungal disease is rare but does occur, and increased awareness is expected for early diagnosis.

Keywords

Breast Cancer, Case Report, Chronic Granulomatous Fungal Disease, Masquerading, Port Harcourt, Nigeria

1. Introduction

The first reported human fungal infection – Tinea favosa, as reported in a documentary titled "History of Medical Mycology in the United States", is credited to David Gruby (Physician and Scientist) and Robert Remak (neurologist,

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physiologist and embryologist) between 1837 and 1841. [1, 2] However, an Italian lawyer and farmer-Agostino Bassi in 1835 was the first to discover the association between fungal epidemic disease in silkworms (muscardine) and fungal infection. [1] Since these reports, there have been improvement in diagnostic tools with many reports of fungal infections occurring in many parts of the body especially the skin, [3-6] and other parts of the body commonly in immunocompromised patients. [7-10].

Extracutaneous or deep-seated mycosis of the breast tissue is rather rare, however, it has been described in some parts of the world. There was a report of four patients-three live and 1 autopsy – from Cincinnati in Ohio United States of America published in 1974. [11] Forty-five autopsy cases of systemic mycosis including the breast was also reported from Chicago in the United States. [12] In the year 2011 in Toronto Ontario in Canada, a 56-year-old man was seen with a breast mass in which after due evaluation it was reported to be fungal in origin. [13] There are few other reports of breast mycoses from India, [14-16] Indonesia, [17] Berlin Germany, [18] Russia, [19] etc. More recently, co-existence of mycosis and cancer in the breast tissue and the role of fungi (mycobiome) in tumorigenesis have also been described. [20-23] Mycotic pseudo-breast tumor has been reported in Africa, [24] some of which were in immunocompromised patients requiring a high index of suspicion. Three cases of breast mycosis were reported from Pretoria in South Africa in year 2021 in which two of the patients had human immunodeficiency virus infection. [24].

Breast cancer is a global public health disease that has assumed foremost position among female cancers. [25, 26] There is therefore increased awareness as healthcare practitioners have sharpened their skills with high index of suspicion for breast cancer lesions. However, some breast lesions in their manifestation, have some resemblance to breast cancer, and hence present to the practitioners with unusual features which do not completely fit into the diagnosis of breast cancer. [27-29] It becomes more challenging when such disease condition appears not to be common. One of such is the occurrence of granulomatous fungal infection of the breast, [30] which is rather a rare disease entity in our subregion. This is evident from the findings of a systematic review of skin manifestations of deep mycosis in Nigeria which concluded that a decline in reporting might suggest neglect or a low index of suspicion. [31] Among the eight cases of fungal diseases seen in tissue biopsy in Ile-Ife in Nigeria over a five-year period, Aspergillosis of the breast was reported in one of them. [32] Another breast fungal disease was reported in a post-renal transplantation immune-compromised Nigerian woman. [33] The aim of this study was to report the features of unusual chronic granulomatous fungal disease that presented to our health facility with features of breast cancer in the first half of year 2025, to further enrich the literature on this rare disease condition.

2. Case Presentation

Clinical History: A 37 year-old female civil servant presented to General Surgery Outpatient Clinic on referral from a health center following a history of left breast lump of 5 months duration. She was a breast-feeding mother who had noticed swelling in the left breast. Patient admitted to a history of fever at the onset of the illness, associated with breast pain, and hotness around the involved area of the breast. The swelling later progressed to form a "boil" which ruptured and discharged some relatively clear fluid. Subsequently, she noticed the appearance of more "boils" with associated changes in the skin and thickening of the left breast. There was no history of trauma before the onset of symptoms, no cough or drenching night sweats, and no contact with any one with chronic cough. Patient declined history of use of occlusive/herbal/trado-medical applications to the breast. She had had antibiotic treatment and a biopsy taken before referral to our center. The past medical history, drug history, allergy histories were unremarkable. She was married with children, and did not use tobacco, but took alcohol occasionally. The review of the systems revealed no additional symptoms.

Clinical Examination Findings: There were no abnormal findings in general examination, head and neck, and the chest. The right breast was normal. There was gross breast asymmetry with the left breast being bigger, showed hyperemic areas, serous discharge, peau de orange with irregularly shaped scar (previous biopsy scar). The breast had differential warmth, and some tenderness. There was a mass located in the upper outer and upper inner quadrants, measuring 6cm by 8cm with surrounding discharging sinuses. Cardiovascular system examination revealed a pulse rate of 104/minute, blood pressure of 137/90mmHg, and normal heart sounds. There were no abnormal findings in other systems.

Investigations: The patient presented to us with *breast ultrasound scan* (4th January 2025) which showed left-sided complex heterogenous solid mass 5.4cm x 3.5cm with irregular outline; the left axillary lymph node was enlarged and measured 3.2cm x 1.8cm; and the ultrasound diagnosis was left complex breast mass highly suspicious of malignancy. The *abdominopelvic ultrasound scan* result was unremarkable except for presence of uterine leiomyoma and grade I hepatic steatosis. The tissue histopathology result of *Tru Cut biopsy* (4th February 2025) revealed Chronic non-specific mastitis. The result of a *repeat Tru Cut biopsy* (28th February 2025) carried out in another laboratory in the State revealed idiopathic granulomatous mastitis. The results of *kidney function test* (serum electrolyte, urea, and creatinine) were normal. *Serologic investigations* showed Sero-negativity to retroviral screening, and non-reactive to hepatitis B surface antigen (HBsAg) and hepatitis C virus (HCV). The result of *Full Blood Count* revealed a Packed Cell Volume of 39%, Hemoglobin Value of 13g/dl; the Platelet Count was elevated with a value of 490 x 10^9/L (normal range 140-400 x 10^9/L); White

Blood Cell Count showed leukocytosis with a value of 12.1 x 10^9/L (normal range 4.8-10.8 x 10^9/L); the White Blood Cell Differentials showed neutrophils 70%, lymphocyte 22%, monocytes 4%, eosinophils 4%, basophils 0%. Requested repeat Tru-cut biopsy and *Wound Swab Microscopy/Culture/Sensitivity* for bacterial and fungal studies could however not be done (declined) by the patient after commencement of empirical antifungal drugs and visible improvement. The Tuberculin test/Gene X-pert test/Acid fast bacilli were also not done.

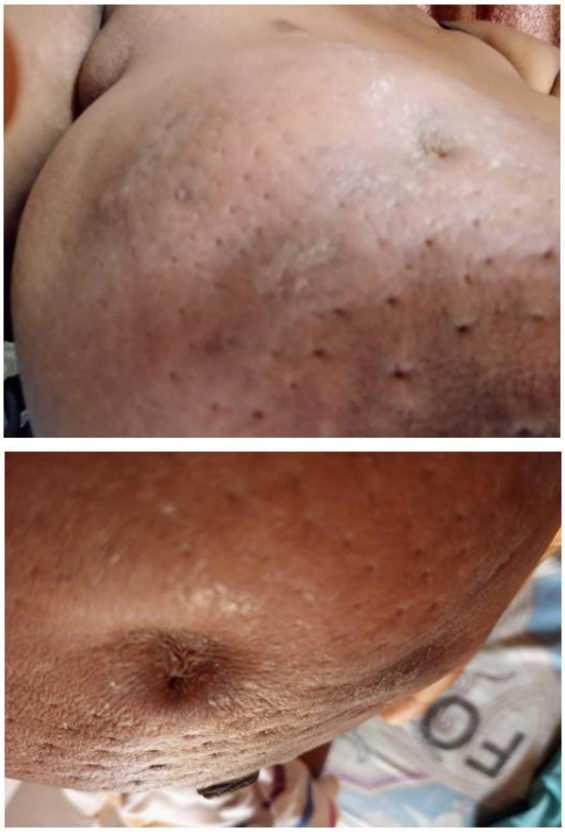

Figure 1. *Left Breast showing Peau de orang and some punctate indurations on the skin of the breast.*

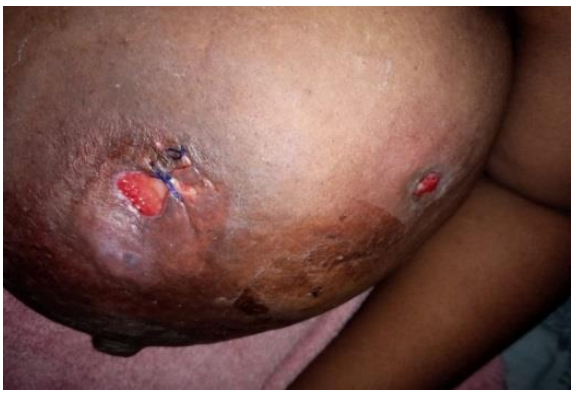

Figure 2. *Left Breast showing some discharging ulcers and suture at biopsy site.*

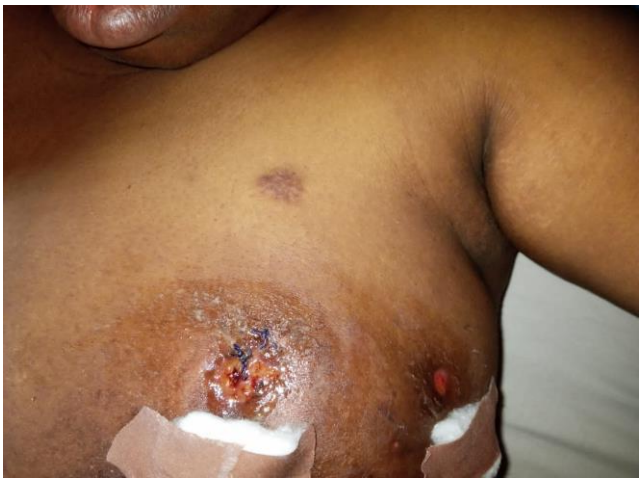

Figure 3. *Left Breast showing some discharging ulcers and suture at biopsy site.*

Diagnosis: A diagnosis of granulomatous fungal breast disease was made. However, the initial diagnosis was breast cancer until proven otherwise.

Treatment: The patient was initially being investigated for breast cancer. However, on second visit, the patient was placed on oral Diflucan, Azithromycin, Chymotrypsin and Prednisone for two weeks, when the result of repeated Tru-cut biopsy revealed Idiopathic granulomatous mastitis. However, patient showed significant improvement as evidence by resolution of fever, pain, drying up of discharge, healing of the ulcers and reduction is the size of the breast mass, although there was still significant size of indurated area.

Follow-Up: The Diflucan was continued for an extended period of one month. The patient had had four follow up visits over a two-month period and healing was progressively sustained, although she had a limited area of induration around the previous sinus sites now scars (see Figure 4). This indurated areas also melted off over time. Repeat breast ultrasound scan/Magnetic Resonance Imaging (MRI) were however, not done as the patient complained of financial challenges and was no longer willing to come for follow up.

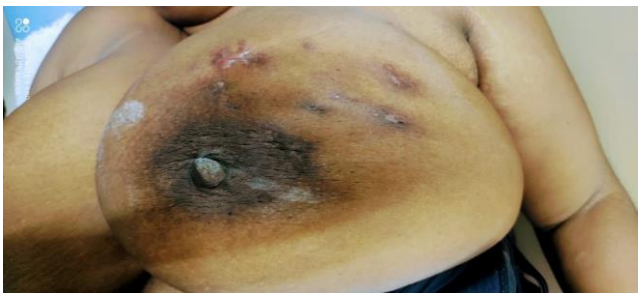

Figure 4. *The left breast during follow-up showing resolution of clinical features.*

3. Discussion

The differential diagnosis of breast mass or granulomatous disease of the breast as described in the literature includes: tuberculosis, foreign bodies and traumatic causes, fat necrosis, silicosis, autoimmune causes (rheumatoid disease, granulomatosis with polyangiitis, and Sjögren's syndrome), idiopathic granulomatous mastitis, sarcoidosis. [30] There have been reported cases of co-existence of breast cancer with breast mycosis, [20, 22] occurrence of breast cancer arising from breast mycosis, [21] however, our study focused on the rare occurrence of breast mycosis masquerading as breast cancer. The clinical features of this patient fit into possible differential diagnosis of chronic breast abscess, tuberculous breast disease, idiopathic granulomatous breast, fungal breast disease, breast cancer. A blend of environmental, patient's factor (host) and organism (agent) has been described to contribute to occurrence of breast mycosis. [34-36] We shall therefore analyze the clinical features in relation to these breast disease conditions.

Our first consideration as diagnosis in this patient was breast cancer, reason being that there was a left breast mass with associated induration, skin changes (ulceration, discharges, hyperpigmentation) and enlarged axillary lymph node. Additionally, breast cancer is the most common cancer among the female population, and the health workers have already developed a high index of suspicion, hence the repeat of tissue biopsy for histopathology on two occasions in different laboratories. A similar repeat of some laboratory test including histopathologic/microscopic analysis has been described for the same reasons in a case report on idiopathic granulomatous mastitis. [29] However, the absence of weight loss, significant resolution of the mass with disappearance of axillary lymph nodes following non-cancer medications, and the result of tissue biopsy showing otherwise on two occasions were enough evidence against the diagnosis of breast cancer in this patient.

The consideration for fungal breast disease stems from the findings of left breast mass with surrounding induration, ulceration and multiple discharging sinuses. Additionally, the presence of fever and breast pain at the onset of the illness; eventual persistence of the illness for 5 months despite administration of different types of antibiotics in a peripheral healthcare setting; and resolution following extended administration of antifungal medications (although microbiologic evidence of fungal infection could not be established); all gave strength to the diagnosis of breast fungal mycosis. Our study share similarity with the findings in some earlier studies. [14, 24, 33] However, bearing in mind that serologic tests were all seronegative/non-reactive, and the portal of entry of the fungal organism was uncertain in this patient, the possible mechanism of occurrence could only be deduced. Although we did not have strong evidence in this patient, occurrence of cracked nipple in a lactating mother contaminated with fungal agents from the baby's mouth, could likely have led to a mixed bacterial and fungal infection resulting in this clinical picture. Similar postulations have been reported. [37-39] Certain sex habits-combined clitoral/nipple sucking during sexual act could also explain this rare occurrence. This has similarly been emphasized by researchers. [40, 41] An additional possibility for the occurrence of granulomatous fungal breast disease is insect bite–associated invasive fungal infections as reported in a study from Houston, Texas City in the United States of America. [42].

Tuberculous breast disease was unlikely in our patient as there was no history of weight loss, night sweats, cough or contact with anyone with chronic cough. Although the tests for tuberculosis were not done, the clinical features did not support this diagnosis, and the patient's recovery following anti-fungal agents did not also support such diagnosis. It could also not have been traumatic fat necrosis which is often sterile, and there was no history of trauma in our patient. Pure idiopathic granulomatous breast disease is often a diagnosis of exclusion, and did not apply in this patient, since she recovered following antifungal therapy.

Study Limitations: This study is limited in the fact that we could not carry out microbiologic isolation of the fungal organism before commencing antifungal therapy. A window of opportunity is therefore opened in the future by virtue of this study, for a prospective or retrospective study on fungal breast disease.

4. Conclusion

The symptoms and signs of breast cancer and breast mycosis share some similarities. Breast fungal disease is rare but does occur, and increased awareness is expected for early diagnosis especially when tissue histopathologic analysis is negative for cancer.

5. Other Information

Acknowledgement: Mrs. M. O. graciously granted consent for the use of her clinical features (without personal details) enabling the publication of this article, for which we are very grateful.

Research Ethics Approval: The approval of the Research and Ethics Committee of the Rivers State University Teaching Hospital was obtained and a written consent of the patient was secured.

Source of Funding: The research was self-funded by the authors.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Espinel-Ingroff A. History of medical mycology in the United States. Clinical microbiology reviews. 1996; 9(2): 235-72.

[2] Ainsworth GC, Ainsworth GC. Introduction to the history of medical and veterinary mycology: Cambridge University Press; 2002.

[3] Borgers M, Degreef H, Cauwenbergh G. Fungal infections of the skin: infection process and antimycotic therapy. Current drug targets. 2005; 6(8): 849-62.

[4] Crawford F, Hollis S. Topical treatments for fungal infections of the skin and nails of the foot. Cochrane Database of Systematic Reviews. 2007(3): 1-154.

[5] Berger AP, Ford BA, Brown-Joel Z, Shields BE, Rosenbach M, Wanat KA. Angioinvasive fungal infections impacting the skin: Diagnosis, management, and complications. Journal of the American Academy of Dermatology. 2019; 80(4): 883-98. e2.

[6] Rezabek GH, Friedman AD. Superficial fungal infections of the skin: Diagnosis and current treatment recommendations. Drugs. 1992; 43(5): 674-82.

[7] Anaissie E. Opportunistic mycoses in the immunocompromised host: experience at a cancer center and review. Clinical Infectious Diseases. 1992; 14(Supplement_1): S43-S53.

[8] Basiri JS, Khaksar AA. Deep-seated fungal infections in immunocompromised patients in Iran. Iranian journal of allergy, asthma and immunology. 2005; 4(1): 27-32.

[9] Walsh TJ. Management of immunocompromised patients with evidence of an invasive mycosis. Hematology/oncology clinics of North America. 1993; 7(5): 1003-26.

[10] Kershenovich R, Sherman S, Reiter O, Huss SR, Didkovsky E, Mimouni D, et al. A unique clinicopathological manifestation of fungal infection: a case series of deep dermatophytosis in immunosuppressed patients. American Journal of Clinical Dermatology. 2017; 18: 697-704. https://doi.org/10.1007/s40257-017-0276-y

[11] Salfelder K, Schwarz J. Mycotic Pseudotumors of the Breast: Report of Four Cases. Archives of Surgery. 1975; 110(6): 751-4.

[12] Rappaport H, Thomas LB. Mycosis fungoides: the pathology of extracutaneous involvement. Cancer. 1974; 34(4): 1198-229.

[13] MacFadden DR, Gold WL, Richardson SE, Bunce PE. A breast mass in a 56-year-old man. CMAJ. 2011; 183(16): 1875-8.

[14] Jain BK, Sehgal VN, Jagdish S, Ratnakar C, Smile SR. Primary actinomycosis of the breast: a clinical review and a case report. The Journal of dermatology. 1994; 21(7): 497-500.

[15] Anandi V, Vishwanathan P, Sasikala S, Rangarajan M, Subramaniyan C, Chidambaram N. Fusarium solani breast abscess. Indian Journal of Medical Microbiology. 2005; 23(3): 198-199.

[16] Sachin MRCNM, Singla KG, Prakash AGSRH. Disseminated Emergomyces pasteurianus Infection in India: A Case Report and a Review. Mycopathologia. 2020; 185, 193–200. https://doi.org/10.1007/s11046-019-00387-y

[17] Durry M, Loho LL. Mycetoma of the Breast: A Case Report. Medical Scope Journal. 2023; 5(2): 266-9.

[18] Opri F. Mammary mycoses. Chemotherapy. 1982; 28(Suppl 1): 61-5.

[19] Klimko NN, Khostelidi SN, Volkova AG, Popova MO, Bogomolova TS, Zuborovskaya LS, et al. Mucormycosis in haematological patients: case report and results of prospective study in Saint Petersburg, Russia. Mycoses. 2014; 57: 91-6.

[20] Błażewicz I, Olszewska B, Stawczyk-Macieja M, Jaœkiewicz M, Nowicki R, Sokołowska-Wojdyło M. The incidences of other primary cancers in patients with mycosis fungoides and Sézary syndrome. Advances in Dermatology and Allergology/Postępy Dermatologii i Alergologii. 2021; 38(2): 289-94.

[21] Guglietta S, Li X, Saxena D. Role of Fungi in Tumorigenesis: Promises and Challenges. Annual Review of Pathology: Mechanisms of Disease. 2025; 20(1): 459-82.

[22] Somashekhar S, Jaiswal R, Kumar R, Ashok B, Rakshit S, Rauthan A, et al. Mucormycosis of the Breast in a Patient With Breast Carcinoma After COVID-19 Pneumonia. European Journal of Breast Health. 2022; 18(3): 289-291. https://doi.org/10.4274/ejbh.galenos.2022.2022-2-4

[23] Velez-Haro JM, Pérez-Rodríguez F, Velázquez-Márquez S, Ramírez Medina H, Velázquez-Márquez N. Mycology in Oncology: Exploring the Role of the Mycobiome in Human Cancer, Etiology, Progression, Epidemiology, Mycoses, and Mycotoxins. Pathogens Associated with the Development of Cancer in Humans: OMICs, Immunological, and Pathophysiological Studies. 2024: 303-48.

[24] Makhubela VG, Khaba MC. Mycotic pseudotumor of the breast secondary to cryptococcal infection: report of three rare cases and literature review. International Journal of Surgical Pathology. 2022; 30(4): 432-6.

[25] Liao L. Inequality in breast cancer: Global statistics from 2022 to 2050. The Breast. 2025; 79: 103851. https://doi.org/10.1016/j.breast.2024.103851

[26] Wilkinson L, Gathani T. Understanding breast cancer as a global health concern. The British journal of radiology. 2022; 95(1130): 20211033. https://doi.org/10.1259/bjr.20211033

[27] Kadam SS, Kadam T. Case Report: Rare Presentation of Aspergillosis of Breast Masquerading as Breast Carcinoma. Carcinogenesis and Chemotherapy. 2023; 2(2). https://doi.org/10.31579/cc.2021/002

[28] Garcia-Rodiguez JA, Pattullo A. Idiopathic granulomatous mastitis: a mimicking disease in a pregnant woman: a case report. BMC Research Notes. 2013; 6: 1-4.

[29] Tuli R, O'Hara BJ, Hines J, Rosenberg AL, editors. Idiopathic granulomatous mastitis masquerading as carcinoma of the breast: a case report and review of the literature. International Seminars in Surgical Oncology; 2007: Springer.

[30] Illman JE, Terra SB, Clapp AJ, Hunt KN, Fazzio RT, Shah SS, et al. Granulomatous diseases of the breast and axilla: radiological findings with pathological correlation. Insights into imaging. 2018; 9: 59-71.

[31] Bassey TE, Okekemba I, Egbara WO, Owai P, Okafor LE, Elem DE, et al. Cutaneous manifestations of deep mycoses in Nigeria: a systematic review. Therapeutic Advances in Infectious Disease. 2024; 11: 20499361241286973. https://doi.org/10.1177/20499361241286973

[32] Olaofe OO, Soremekun AI, Olopade BO, Oladele JO. Fungal and Parasitic Diseases Seen in Tissue Biopsies at a Tertiary Health Center in Southwest Nigeria in a Five-Year Period. International Journal of TROPICAL DISEASE & Health. 2023; 44(11): 17-26.

[33] Jiménez-García N, Fernández Sánchez F, Guillén Rodríguez CM, Castilla Castellano MdM, Del Arco Jiménez A. Breast abscess due to Nannizziopsis obscura in an immunocompromised renal transplant patient after travel to Nigeria: case report and review. BMC Infectious Diseases. 2023; 23(1): 50. https://doi.org/10.1186/s12879-022-07958-3

[34] Belmokhtar Z, Djaroud S, Matmour D, Merad Y. Atypical and Unpredictable Superficial Mycosis Presentations: A Narrative Review. Journal of Fungi. 2024; 10(4): 295. https://doi.org/10.20944/preprints202401.0300.v1

[35] Dogra S, Narang T. Emerging atypical and unusual presentations of dermatophytosis in India. Clinical Dermatology Review. 2017; 1(Suppl 1): S12-S8.

[36] Gnat S, Łagowski D, Nowakiewicz A. Major challenges and perspectives in the diagnostics and treatment of dermatophyte infections. Journal of applied microbiology. 2020; 129(2): 212-32.

[37] Douglas P. Overdiagnosis and overtreatment of nipple and breast candidiasis: A review of the relationship between diagnoses of mammary candidiasis and Candida albicans in breastfeeding women. Women's Health. 2021; 17: 17455065211031480.

[38] Hanna L, Cruz SA. Candida mastitis: a case report. The Permanente Journal. 2011; 15(1): 62-64.

[39] Merad Y, Derrar H, Belkacemi M, Drici A, Belmokhtar Z, Drici Sr AE-M. Candida albicans mastitis in breastfeeding woman: an under recognized diagnosis. Cureus. 2020; 12(12). https://doi.org/10.7759/cureus.12026

[40] Saini R, Saini S, Sharma S. Oral sex, oral health and orogenital infections. Journal of global infectious diseases. 2010; 2(1): 57-62.

[41] Murphy MJ. Getting It On: Sexual Behavior and Sexual Health. Living Out Loud: Routledge; 2018. p. 95-142.

[42] Kontoyiannis PD, Koons GL, Hicklen RS, Mikos AG, Kontoyiannis DP, editors. Insect Bite–Associated Invasive Fungal Infections. Open Forum Infectious Diseases; 2019: Oxford University Press US.