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Case Report

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Cutaneous Mucormycosis in a kidney transplant patient: A case report

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Introduction

Mucormycosis is a fungal disease that evolves rapidly and is associated with a high risk of morbidity and mortality in immunodepressed patients, and which requires multidisciplinary medical and surgical approach. Invasive Fungal Infections (IFIs) is still a diagnostic and therapeutic issue [1,2].

We report the case of a kidney graft patient with cutaneous mucormycosis that was a disastrous evolution in our center. The consent of his family was obtained.

Case report

A 38-year-old man with a past history of chronic renal failure due to reflux nephropathy, tuberculous pleurisy in 2017 treated with quadruple therapy with good clinical and biological evolution.

He was kidney transplanted 2019 from a related living donor, his father sharing 03 HLA identities with him.

The patient received induction Immunosuppression (IS) with antithymocyte globulin and methylprednisolone. Maintenance is consisted of Mycophenolate Mofetil (MMF), tacrolimus, and corticosteroids. The post transplant evolution was marked by the new-onset diabetes on oral antidiabetic agents, repeated urinary tract infections and diarrhea related to taking MMF hence the Azathioprine switch.

The history dates back to January marked by a glycemic imbalance. He presented to the emergency department on January 2021 with diabetic ketoacidosis. As a decompensation factor, he presented a superinfected skin lesion in the left forefoot occurring following a trauma.

The attitude was balancing of diabetes, an increase of the doses of oral antidiabetics and he was treated empirically with amoxicillin-clavulanate and fucidin. The evolution was marked by the improvement of the local state.

The current history goes back a week marked by the occur-

rence of a lower right jugal ulcerated lesion following a skin irritation associated with shaving. The lesion evolved rapidly and formed painful erythematous swelling on the right side of his face in three days.

The patient was hospitalized in the emergency room from January 23 to 25 for compensation for his diabetes. The lesion has not been explored. Then he was admitted to our department on January 27.

Physical examination revealed fever. He was dehydrated. Arterial pressure was 120/60 mmHg. He had right-sided peripheral facial paralysis. Ulceronecrotic lesion in relation to the mandible with local inflammatory signs extended up to the mandibular angle and in lateral cervical region with infiltrations of the soft parts without collection (Figures 1,2,3).

Figure 1: Right jugal ulcerated lesion with necrotic centre 3 x 3 cm and surrounding induration.

Figure 2: Right jugal ulcerated lesion with necrotic centre 3 x 3 cm and surrounding induration.

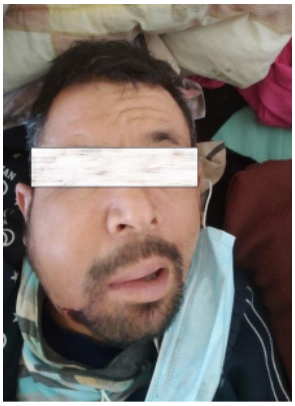

Figure 3: Peripheral facial palsy.

Laboratory findings were:

White blood cells, 6330/mm^3 (segmented neutrophils: 5280, lymphocyte: 150, monocyte: 790, eosinophil: 80, basophil: 30) ; hemoglobin, 9,8 g/dL; and platelets: 379 × 100/mm^3.

Blood chemistry documented: Arterial blood gas: ph: 7,34, pCO_2: 18, HCO_3-: 9,7 pO_2: 115 saO_2: 98 %

Glucose: 35 mmol/l, Blood Urea Nitrogen (BUN): 12,2 mmol/l; creatinine: 147 µmol/l ; C-reactive protein: 129 mg/dL; HBA1C: 7,4%; aspartate aminotransferase: 36 IU/L; alanine aminotransferase: 18 IU/L; lactate dehydrogenase: 427 IU/L; γ-glutamyl transpeptidase: 38 IU/L; T0 tacrolimus: 40 ng/ml, serum ferritin: 380,6 ng/ml

urinary chemistry: glucose +++, ketone +++

Fungal and bacterial culture are negative. Urine culture was negative.

The chest radiograph is normal.

Soft tissue ultrasound showed no parotid collection except a diffuse oedematous infiltration.

The management of diabetic ketoacidosis has been initiated.

On the basis of these findings, we considered the possibility of bacterial infection and mycosis and we started empirically teicoplanin, imipenem and metronidazole.

On the second hospital day, surgical debridement was decided upon, and a complete excision of lesion, and coverage was performed (Figure 4).

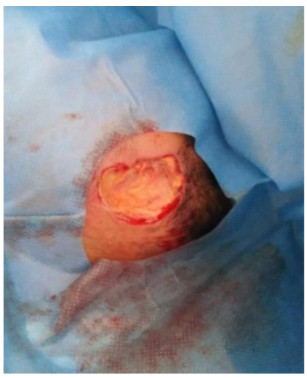

Figure 4: Right jugal lesion after debridement.

Bacterial culture of skin biopsy from the lesion revealed polymorphic.

Direct mycological examination from the skin biopsy of the right jugal ulcerated lesion showed numerous large and non-septal hyphae (Figure 5).

Fungal culture in Sabouraud media grew white and gray mycelia colonies. The back was uncolored. Microscopically, the fungi was identified as Rhizopus arrhizus; the colonies were consisted of large sporangiophores, sporangia and rhizoids (Figure 6).

Histopathological findings revealed broad and non-septate hyphae branching at 90 degrees, accompanied by numerous neutrophils and histiocytes within granulation tissue.

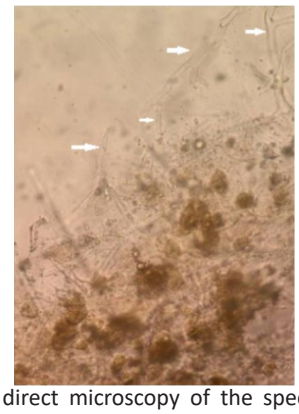

Figure 5: The direct microscopy of the specimen revealing the presence of wide and irregular non-septate hyphae (5–25 µm) (40x magnification).

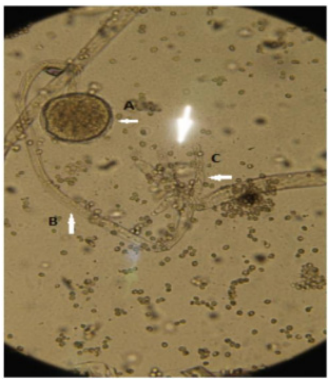

Figure 6: Fungal culture showing Rhizopus arrhizus. A.Sporangium B.Sporangiophore C.Rhizoids (40x magnification).

Special stains with Periodic Acid-Schiff (PAS) and Grocott-Gomori Methenaminesilver (GMS) highlighted fungal hyphae. The diagnosis of mucormycosis was retained (Figures 7,8).

The evolution is marked by sudden death on the second hospital day. PCR SARCOV2 on post-mortem was negative.

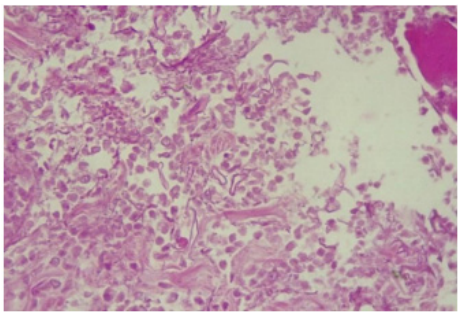

Figure 7: Broad and non-septate hyphae branching at a 90° angle (Hematoxylin and eosin ×400).

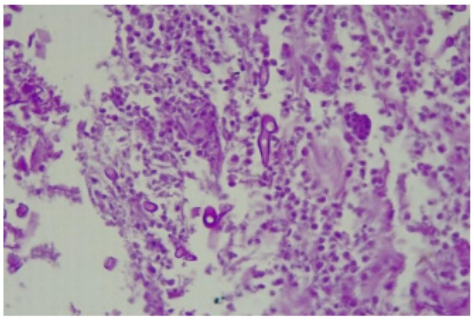

Figure 8: PAS staining highlighting broad aseptate fungal hyphae (×400).

Discussion

Mucormyocosis is an opportunistic mycotic infection caused by fungi in the class Zygomycetes, most commonly in the order Mucorales [3].

These omnipresent saprophytes are commonly located in the soil. Microscopically, they are characterized by their wide, aseptate hyphae and irregular branching [4].

Even though Zygomycetes are prevalent in the environment, this fungal disease is a very rare human infection due to the efficiency of the healthy human immune system. It is actually reported to be the third most prevalent invasive mycosis after candidiasis and aspergillosis, even though in kidney transplant recipients it has been noted as the major contributor to the disease [2].

Its incidence has been rising in the last years due to the higher availability and use of immunosuppressive drugs for diverse therapeutic prescriptions, as also to the wide pandemic due to metabolic disorders, like diabetes mellitus [5].

The mean delay between RT and the diagnosis of mucormycosis was 2.5 months [6]. In our case, the onset was about 18 months after his transplant.

Our patient was a male. Many studies demonstrate that the prevalence of this infection is more common in male recipients. Some authors hypothesize that sexual preference may be a consequence of the beneficial role of estrogen [6].

Risk factors for mucormycosis comprise advanced age, diabetes, hematologic malignancies, solid organ or stem cell transplantation and immunosuppression [1].

Patients with uncontrolled diabetes mellitus, particularly those presenting with diabetic ketoacidosis, are most vulnerable to this infectious condition. Artis et al proved that acidosis transiently inhibits the link of iron to transferrin, thus inducing the multiplication of the fungus, revealing that iron is an essential growth enhancer [7].

Kidney transplant recipients are at increased risk for developing opportunistic infections due to the immunosuppression by cytotoxic drugs and steroids and metabolic disorders like hyperglycemia, uremia, and malnutrition [8].

Mucormycosis is most frequently contracted within the time interval of immunosuppression, between 1 and 6 months after the transplantation [9]. The escalation of immunosuppression for the management of rejection is combined with an enhanced incidence of fungal diseases [9].

The infested tissues usually evolve infarcts and necrosis as a consequence of the hyphae invasion of the circulatory system. The thrombosis of vessels by mucor fungi and tissues necrosis are both main characteristics of mucormycosis [10].

There were reports of mucormycosis occurring after a minor dermal traumatism (burns, lacerations, abrasion or tattoo) [12], following an intramuscular injections [13]. Hematogenous spread rarely may cause cutaneous mucormycosis.

We assume that fungal colonization in our patient occurred following the shaving.

In addition, the clinical manifestation differs depending on the site involved. Cutaneous mucormycosis can vary from a chronic infection to a rapid progression of the disease. There is

no specific symptom for mucormycosis. The most usual signs of cutaneous mucormycosis are necrotic lesions. In Additionally, patients may develop fever, severe aches, cutaneous erythema, cellulitis, and vesicles [15]. Besides of the ulcero necrotic lesion, our patient had right-sided peripheral facial paralysis, due to the damage of marginal mandibular branch of the facial nerve.

A strong suspicion index is required to identify this disease.

In transplant patients, it is extremely challenging to diagnose fungal mucormycosis because of the lack of serologic tests and the difficulty of the isolation and culture of the organism from affected organs, blood and body fluids. The earlier diagnosis is crucial in view of the rapid progression of this infection and is based on clinical perceptions which are confirmed by microscopic examination of the biopsy sample [16].

But in view of the life-threatening consequences, a high suspicion is required and an early management would be considered appropriate even in the absence of histological evidence [18]. The treatment of mucormycosis is based on systemic antifungal drugs, intensive debridement of affected and necrotic tissues, and the management of contributing factors.

Maintenance of therapy is indicated until the infection is completely resolved, though this generally requires many months. Amphotericin B has become the cornerstone of initial treatment for mucormycosis. Posaconazole may be beneficial as a rescue therapy, and combination therapy has been promoted to improve the outcome. Voriconazole is not effective [1].

It also comprises reduction of immunosuppressive drugs, and correction of metabolic disturbances.

The prognosis of mucormycosis is extremely unfavorable, despite intensive therapy.

The cutaneous variety is uncommon but has the better survival if detected earlier as the cutaneous damage can be removed completely in many cases [20]. Mucormycosis is a highly lethal fungal infection and usually associated with devastating outcomes especially in patients with delayed diagnosis [21].

When our patient was admitted, he had an advanced infection. He was died on the second hospital day.

Conclusion

In conclusion, mucormycosis is still a critical menace in RT patient. The combination of surgical debridement and antifungal agents (amphotericin B formulation and posaconazole) can substantially improve the patient's global survival. Clinicians should intensify cautions against mucormycosis in RT recipients. It is crucial to detect mucormycosis at an early stage, since early management can improve the result. Therefore, it is hard to establish standard guidelines for future directions, but a high suspicion index and well-timed treatment can contribute to saving patients from this fatal disease.

References

1. Chung JH, David Godwin J, Chien JW, SJ Pipavath. Pulmonary Mucormycosis.
2. Tamim Hamdi, Vanji Karthikeyan, George J. Alangaden. Mucormycosis in a Renal Transplant Recipient: Case Report and Comprehensive Review of Literature.
3. Lass-Flörl C. Zygomycosis: Conventional laboratory diagnosis.
4. Nieto Ríos JF, Moreno Coral LF, Andrés Zapata Cárdenas, Catalina Ocampo Kohn, Arbey Aristizabal-Alzate, et al. Successful treatment of rhino-orbital-cerebral mucormycosis in a kidney transplant patient.
5. Nieto Ríos JF, Moreno Coral LF, Andrés Zapata Cárdenas, Catalina Ocampo Kohn, Arbey Aristizabal Alzate, et al. Successful treatment of rhino-orbital-cerebral mucormycosis in a kidney transplant patient.
6. Yan Song, Jianjun Qiao, Gaffi Giovanni, Guangjun Liu, Hao Yang, Jianyong Wu and Jianghua Chen. Mucormycosis in renal transplant recipients: Review of 174 reported cases.
7. Sajid Latif, Nasser Saffarian, Keith Bellovich, and Robert Provenzano. Pulmonary Mucormycosis in Diabetic Renal Allograft Recipients.
8. SM Godara, VB Kute, KR Goplani, MR Gumber, DN Gera, PR Shah, AV Vanikar, HL Trivedi. Mucormycosis in Renal Transplant Recipients: Predictors and Outcome.
9. KL Gupta1, Kusum Joshi, Kohli HS, Vivekanand Jha and Vinay Sakhuja. Mucormycosis (zygomycosis) of renal allograft.
10. Chkhotua A, Yussim A, Tovar A, Weinberger M, Sobolev V, Bar Nathan N. Mucormycosis of the renal allograft: Case report and review of the literature.
11. Graft mucormycosis in a renal allograft recipient Mufazzal Ahmad Department of Nephrology, Sanjay Gandhi Institute of Medical Sciences (SGPG IMS), Lucknow – India.
12. Carbone KM, Pennington LR, Gimenez LF, Burrow CR, Watson AJ, et al. Mucormycosis in Renal Transplant Patients - A Report of Two Cases and Review of the Literature.
13. Jain JK, Markowitz A, Khilanani PV, Lauter CB. Localized mucormycosis following intramuscular corticosteroid. Case report and review of the literature.
14. Gary Gartenberg, Bottone EJ, Keusch GT, Irene Weitzman, Hospital-Acquired Mucormycosis (Rhizopus rhizopodiformis) of Skin and Subcutaneous Tissue- Epidemiology, Mycology and Treatment.
15. Setareh Davuodi, Seyed Ali Dehghan Manshadi, Mohammad Reza Salehi, Farhad Yazdi, Mona Khazravi, Jafar Taghizade Fazli. Fatal Cutaneous Mucormycosis After Kidney Transplant.
16. Cohen SG, DMD, Martin Greenberg, D.D.S., Philadelphia, Pa. Albert einstein medical center and university of pennsylvania. Transplant patient.
17. Skiada A, Lass Floerl C, Klimko N, Ibrahim A, Roilides E, Petrikkos G. Challenges in the diagnosis and treatment of mucormycosis. Med Mycol. 1 avr. 2018; 56: 93 101.
18. John F Nieto Ríos, Luis F Moreno Coral, Andrés Zapata Cárdenas, Catalina Ocampo-Kohn, Arbey Aristizabal Alzate, et al. Zuluaga-Valencia. Successful treatment of rhino-orbital-cerebral mucormycosis in a kidney transplant patient.
19. Disseminated Mucormycosis in a Patient with Recent Kidney Transplantation: A Case Report and Review of the Literature Mohamad Hazem Hatahet Mohanram Narayanan Constance Cleaves Riyam Zreik Scott & White Healthcare/Texas A&M Health Science Center College of Medicine, Temple, Tex., USA.
20. Brad Spellberg, John Edwards, Ashraf Ibrahim. Novel Perspectives on Mucormycosis: Pathophysiology, Presentation, and Management.
21. Skiada A, Lass Floerl C, Klimko N, Ibrahim A, Roilides E, Petrikkos G, et al. Challenges in the diagnosis and treatment of mucormycosis.