Clinical Images and Case Reports Journal

Case Report | Vol 2 Iss 3

Isolated Cardiac Cryptococcosis in an Immunocompetent Host

Carlos Felipe Barrera-Ramirez[1*], Angelica Noemi Diaz-Castano[2], Hermes Ilarraza-Lomeli[3], Luis Ramon Pineda-Pompa[1], Maria Del Rayo Pacheco-Rios[3] and Gabriel Rivera-Rios[4]

[1]Division of Interventional Cardiology, Centro Hospitalario La Concepcion, Saltillo, Coahuila de Zaragoza, Mexico

[2]Infectology and Microbiology Service, Centro Hospitalario La Concepcion, Saltillo, Coahuila de Zaragoza, Mexico

[3]Cardiac Rehabilitation Service, Instituto Nacional de Cardiologia, "Ignacio Chavez", Mexico

[4]Radiology and Image Service, Centro Hospitalario La Concepcion, Saltillo, Coahuila de Zaragoza, Mexico

[*]**Corresponding author:** Carlos Felipe Barrera-Ramirez, Division of Interventional Cardiology, Centro Hospitalario La Concepcion, Blvd. V. Carranza 4036-1H, Colonia Villa Olimpica, CP 25230, Saltillo, Coahuila de Zaragoza, Mexico, E-mail: carlosfbarrera@yahoo.com

Received: May 27, 2020; **Accepted:** June 10, 2020; **Published:** July 03, 2020

Abstract

Herein we inform an unusual case of an immunocompetent man who had a large pericardial effusion, tamponade and myocardial cryptococcomas due to isolated cardiac cryptococcosis. The patient was a man aged 61, who was admitted on January 28th, 2016. Type 2 diabetes mellitus 7 years of diagnosis. 30 pack-year smoking history. Worker of the iron industry for forty years. No history of tuberculosis exposure and pigeon breeding negative.

Keywords: Cardiac cryptococcosis; Immunocompetent host; Dyspnea

Case Report

Current condition started 4 weeks earlier with progressive dyspnea, with rapid progression to paroxysmal nocturnal dyspnea. On physical examination: heart rate 75 beats/min, respiratory rate 24 breaths/min, blood pressure 90/60 mmHg, pulse oximetry 85 %, BMI 28.7. He appeared lethargic, painful facies, cold, clammy and pale skin, jugular venous distention, Kussmaul sign positive, paradoxical pulse of 12 mmHg, abolished cardiac sounds; bilateral pleural effusion less than 30 % of the lung fields, non-painful hepatomegaly 3 cm below the costal border. Filiform pulses. Beck's triad was complete.

Electrocardiogram revealed sinus rhythm, generalized low voltage, left anterior fascicular block. A chest x-ray showed cardiomegaly, water bottle sign and bilateral pleural effusion.

A transthoracic echocardiogram showed extensive pericardial, swinging heart, diastolic collapse of right cavities, paradoxical septal movement, and restrictive filling pattern. Heteroecogenic nodulations were observed in the right ventricular free wall.

A pericardiocentesis was performed with total extraction of 1,200 cc of haemorrhagic fluid. The analysis of pericardial fluid with india ink preparation and lactophenol cotton blue stain showed round and oval encapsulated structures compatible with

Cryptococcus neoformans (Figure 1A and 1B); Cytochemical study: pH 8.0, proteins 1,543 mg/dL and >14,000 cells/mm3, predominance of polymorphonuclear cells.

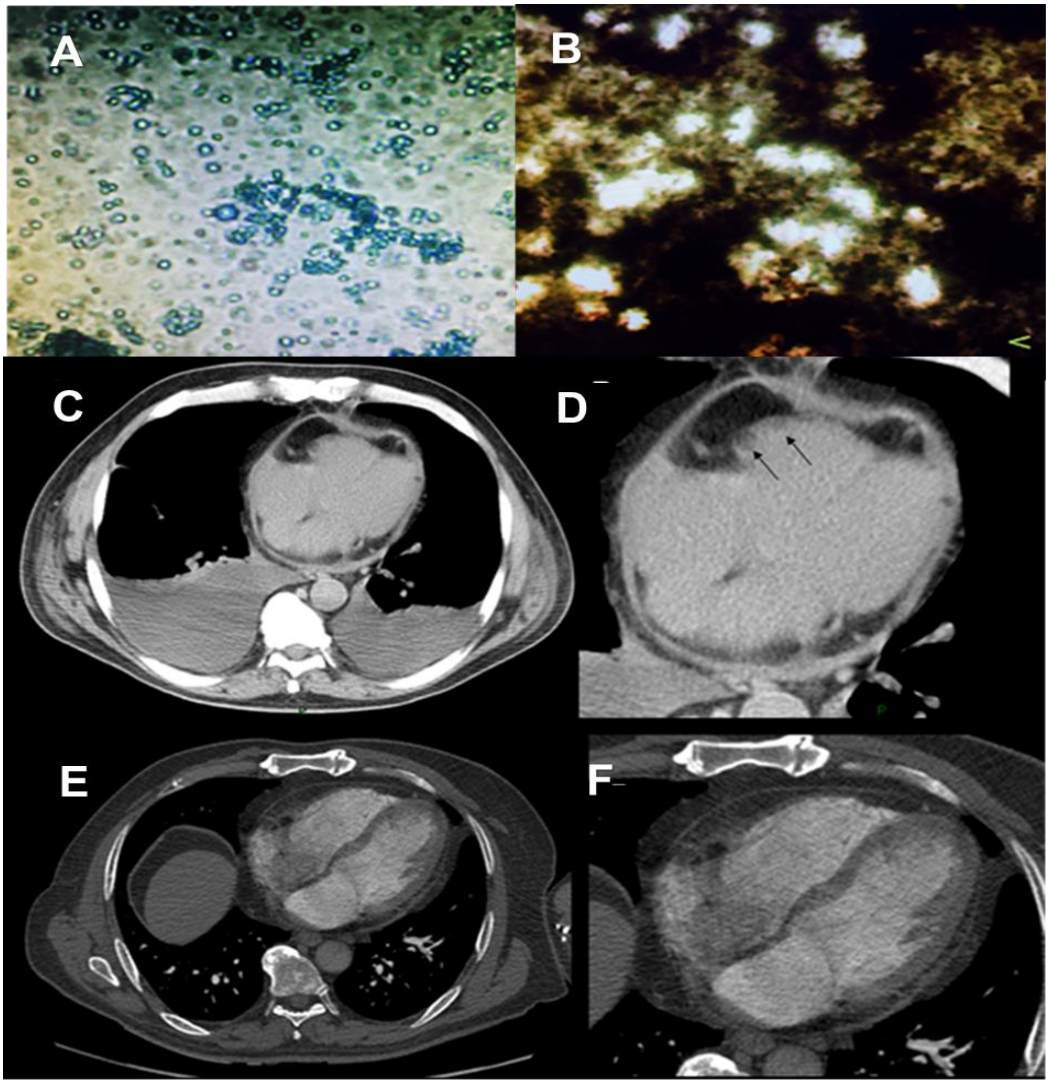

Figure 1: (A): Lactophenol cotton blue staining highlights the capsule surrounding each of the abundant yeasts during the direct examination of the pericardial fluid smear. Some cells with gemmation are observed, that may be an indicator of active infection; **(B):** Photomicrograph of an India ink strain in the pericardial fluid smear showing C. neoformans. The particles of ink pigment do not enter the capsule that surrounds the spherical yeast cell, resulting in a zone of clearance or "halo" around the cells; **(C and D):** Chest CAT scan showed bilateral pleural effusion, minimal pericardial effusion with two elyptical masses in the free wall of right ventricle (arrows) corresponding to cryptococcomas; **(E and F):** Intravenous contrast chest CAT scanning 20 months after the initial event; cryptococcomas have disappeared.

Laboratory: hemoglobin 6.6 g/dL, hematocrit 20.4 %, leukocytes 14,100/mm3, lymphocytes 43 %, monocytes 1 %, neutrophils 56 %, platelets 422,000/mm3. Troponin 0.04 µg/L (normal range [NR] <0.01), creatinine 3.4 mg/dL, urea 139 mg/dL, glucose 231 mg/dL, complement C4 10.9 mg/dL (NR 10-40). Complement C3 80.7 mg/dL (NR 90-180). Although we expected high C3 and C4 values as an acute phase response, allowed to rule out autoimmune diseases. Quantification of CD4, CD8 and T lymphocyte cells were normal, suggesting a preserved cell-mediated immune response. Quantitative serum antibodies against C. neoformans titer 1:2, agglutination titers ≥ 1:2 is suggestive of infection with C. neoformans. The intentional search for cryptococcus with direct blood, pleural fluid and urine exam was negative, as cultured. The discrete troponin elevation was attributed to the presence of cardiac masses.

We discarded AIDS, cancer and other debilitating diseases, as well as the involvement of other organs by cryptococcus, the patient was considered as immunocompetent and we ruled out disseminated form of the disease.

Chest Computed Axial Tomography (CAT) scan was performed and revealed two hypodense nodular lesions in the right ventricular free wall 9 x 9 and 6 x 5 mm respectively with -37 HU and -14 HU (Figure 1C and 1D). The patient was transfused, treatment with intravenous voriconazole 200 mg b.i.d. was started during 2 weeks then switched to oral itraconozole 400 mg b.i.d. during 8 months; continuing with favorable evolution with resolution of acute renal failure and pleural effusion without recurrence of pericardial effusion. Ventricular wall masses disappeared 2 months later on the echocardiogram and after two-year follow-up the patient is asymptomatic and with normal CAT (Figure 1E and 1F).

Discussion

Cardiac mycosis is increasingly described especially in immunocompromised patients [1-3]. Fungal cardiac involvement can occur as myocarditis, pericarditis or endocarditis, but cryptococcosis is extremely rare in an immunocompetent. Cardiac cryptococcosis is occasionally observed in disseminated cryptococcosis form, by hematogenous dissemination [1-3]. It is an opportunistic disease that results from infection with the fungus C. neoformans or C. gattii, usually transmitted by inhaling bird droppings, mainly pigeons. In Mexico, C. neoformans has been isolated in 20.7 % of pigeons [3,4]. The person-to-person transmission does not exist, but is possible occur through transplanted organs [2].

It is estimated that the global burden of the disease is close to 1 million cases with 700,000 deaths annually [5].

The target organs mainly affected are brain and CNS and represent the site where 50 % of the cases are generated due to the fungus tropism, in second place lung is affected [6-9]. Cardiac cryptococcosis has only been described in disseminated form, and the first case was reported in 1965 in a man with disseminated cryptococcosis, myocarditis, ventricular tachycardia and heart failure, necropsy sustained diagnosis [10]. Cardiac involvement due to C. neoformans is uncommon, but when it develops, it may be as myocarditis, pericarditis, pericardial effusion, tamponade or endocarditis, observed during the disseminated form, in HIV-AIDS patients or associated with solid organ transplantation [1,3,5]. Regarding clinical presentation as tamponade, reports of cryptococcal pericarditis had only been observed in patients with HIV-AIDS or drug abuse [1,9]. To the best of our knowledge, there are no reports of isolated cardiac cryptococcosis in an immunocompetent host.

Another relevant aspect in our case is the presence of tumor-like masses in the myocardium. In other organs that are frequently affected, the anatomo-pathological study has shown that parenchymal involvement by the microorganism results in the presence of masses formed by the confluence of cysts of various sizes, containing transparent mucoid material. Histological study shows little or no inflammatory response, with distension and lysis of the adjacent tissue [9,10]. These lesions are called cryptococcomas, torulomas or cryptococcal granulomata [3]. In our case myocardial cryptococcomas resolved after treatment.

Conclusion

Cryptococcosis is an uncommon manifestation in immunocompetent patients. A high level of suspicion is required for diagnosis. Early detection of the disease and adequate treatment are essential to achieve a better prognosis.

To the best of our knowledge, this is the first case report of isolated cardiac cryptococcosis.

REFERENCES

1. Alhaji M, Sadikot RT. Cryptococcal endocarditis. South Med J. 2011; 104: 363-364.
2. Galnares-Olalde JA, Loza-Jalil S, Gomez-Pena F, et al. Criptococosis meningea en un paciente inmunocompetente: Reporte de un caso y revision de la literatura. Rev Med Hosp Gen Mex. 2014; 77: 137-141.
3. Vazquez O, Martinez BI, Campos T. Criptococosis: Historia natural y estado actual del tratamiento. Act Pediatr Mex. 2005; 26: 18-28.
4. Kwon-Chung KJ, Fraser JA, Doering TL, et al. *Cryptococcus neoformans* and *Cryptococcus gattii*, the etiologic agents of cryptococcosis. Cold Spring Harb Perspect Med. 2014; 4: a019760.
5. Levy PY, Habib G, Reynaud-Gaubert M, et al. Pericardial effusion due to *Cryptococcus neoformans* in a patient with cystic fibrosis following lung transplantation. Int J Infect Dis. 2008; 12: 452.
6. Nakajima T, Oba Y, Takashima J, et al. *Cryptococcus endocarditis*: A case report and review of the literature. J Infect Chemother. 2019; 25: 901-905.
7. Lin X. Cryptococcus neoformans: Morphogenesis, infection, and evolution. Infect Genet Evol. 2009; 9: 401-416.
8. Kozubowski L, Heitman J. Profiling a killer, the development of *Cryptococcus neoformans*. FEMS Microbiol Rev. 2012; 36: 78-94.
9. Godoy U, Rodriguez PL, Medrano J, et al. Cardiac tamponade in disseminated cryptococcosis. Rev Argent Cardiol. 2015; 83: 355-357.
10. Jones I, Nassau E, Smith P. Cryptococcosis of the heart. Br Heart J. 1965; 27: 462-464.