

## CASE REPORT

# Pulmonary thrombectomy due to aspergillus in immunocompromised patient. A case report.

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*Aspergillus* represents 1% of infective endocarditis, and infects immunocompromised hosts. A 12-year-old male with diagnosed Hodgkin's lymphoma presented a relapse. Left apical condensation was identified by Computerized Tomography (CT) and an *Aspergillus* infection was suspected. Under antifungal treatment there was no clinical improvement. By CT scan and scintigraphy the diagnosis of endocarditis in the right pulmonary artery and superior vena cava was established. The patient underwent surgical procedure as pulmonary thrombectomy. *Aspergillus* is isolated in 20-30% of fungal endocarditis cases. In such cases, the most effective treatment is the surgical one.

**Key words:** *Aspergillus*; Immunocompromised status; Pulmonary thrombectomy.

*Aspergillus*, representa 1% de endocarditis infecciosa, e infecta huéspedes inmunocomprometidos. Un paciente masculino de 12 años de edad con Linfoma Hodking presentó una recaída. Se identificó por TAC condensación apical izquierda y se sospechó infección por *Aspergillus*. No hubo mejoría clínica bajo tratamiento antifúngico. Por TAC y Gammagrafía se diagnosticó endocarditis en Rama Derecha arteria pulmonar y vena cava superior. Se sometió a procedimiento quirúrgico como trombectomía pulmonar. El *Aspergillus* se aísla en 20-30% de casos de endocarditis micótica. En tales casos, el tratamiento resolutivo es la cirugía.

**Palabras clave:** *Aspergillus*; Estado inmunocomprometido; Trombectomía pulmonar.

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All *Aspergillus* species can cause severe invasive infections in almost all organs, including the nasal passages, lungs, heart, and central nervous system. Infections by *Aspergillus* commonly attack immunocompromised hosts by compromising the respiratory tract [1].

From a clinical point of view, the term aspergillosis includes such diseases of different pathogenesis as allergic bronchopulmonary aspergillosis, non-invasive or semi-invasive chronic pulmonary forms, invasive airway forms, cutaneous forms, and extrapulmonary and/or disseminated forms. All of them are generated by different *Aspergillus* species, mainly *A. fumigatus*, *A. flavus* and *A. terreus*. *Aspergillus* is ubiquitous in nature and the inhalation of conidia is a common phenomenon. However, tissue invasion is rare and takes place mainly in neutropenic patients or patients undergoing some degree of cellular immunosuppression. The mortality of invasive types depends on the clinical form and the type of host but is usually higher than 50% [2].

Infective endocarditis is a disease associated with a high risk of morbidity and mortality. The most frequent etiologi-

cal agents are bacteria and fungi [3]. Endocarditis caused by *Aspergillus fumigatus* is one of the rarest and most severe complications that a cardiological patient can face on [4].

*Aspergillus* endocarditis is very rare and represents less than 1% of all cases of infective endocarditis. Patients with such conditions as cardiac abnormalities, valvular heart prosthesis, malignant diseases, permanent central venous lines, long-term use of broad-spectrum antibiotics and intravenous drug use are prone to the disease by *Aspergillus* endocarditis. *Aspergillus* endocarditis is one of the most severe conditions generated by invasive aspergillosis [5].

Here is a document in which we expose a case of *Aspergillus fumigatus* endocarditis associated with immunosuppression in a patient with an underlying neoplasm. Also, the surgical technique is detailed.

## CLINICAL CASE

We bring to light the case of a 12-year-old male patient diagnosed with Hodgkin's lymphoma with relapse in the abdomen, who began treatment with chemotherapy and

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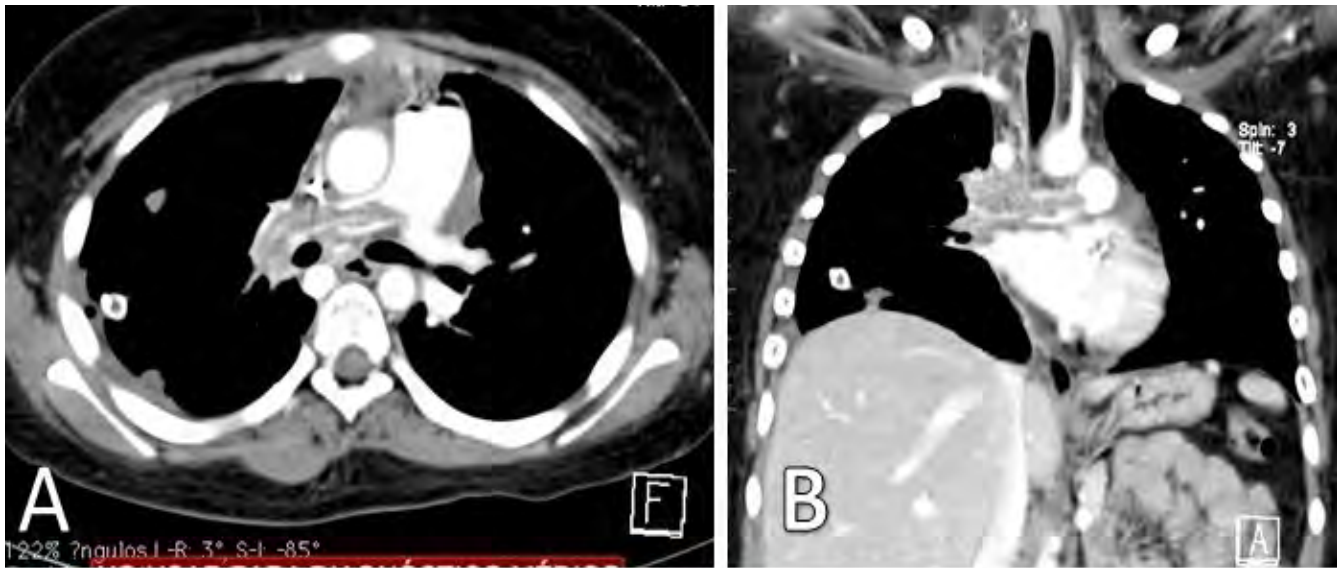


Figure 1. A. CT chest with contrast. A. region corresponding to the right pulmonary artery is observed with an obstruction to the contrast passage, which corresponds to the thrombosis area from the junction to the bifurcation. B. Coronal chest section. The right pulmonary artery with obstruction and no passage of the contrast medium, displaying a filling defect.

afterwards an autologous bone marrow transplantation was performed later in the treatment, then remaining under controlled surveillance.

After four years of cancer diagnosis and treatment, he presented multiple infections. A diagnostic approach was started, corroborating left apical condensation with computerized axial tomography (CT) and thereby suspecting the presence of an *Aspergillus* infection, finally verified with blood culture and galactomannans.

Antifungal treatment was started no improvement of the systemic inflammatory response. Thus, endocarditis was suspected. CT scan reported an image compatible with right pulmonary thromboembolism and thrombus in the superior vena cava (Fig. 1).

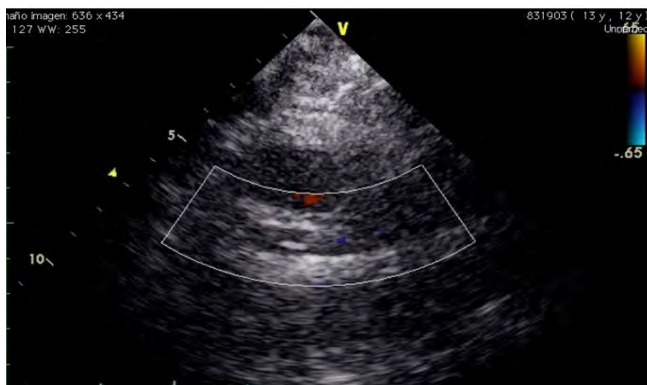


Figure 2. Doppler Color echography. A hyperechoic area is observed in the lumen of the right pulmonary artery corresponding to a thrombus that takes up more than 90% of lumen of the vessel.

Tc99 scintigraphy showed highly suggestive data of an active infectious process at the mediastinal and pulmonary levels. In addition, an echocardiogram made evident the absence of flow towards the right pulmonary artery in Doppler color mode. Also, a hyperechoic image blocking a large part of the lumen was observed (Fig. 2).

Due to a lack of response to medical treatment, the patient underwent surgical procedure. It was found a set of fibrin thrombi with caseous and purulent material blocking the whole right pulmonary artery until reaching the region beyond the lobar bifurcation, with no distal blood return (Fig. 3A).

The superior vena cava was blocked all the way from the innominate artery until its drainage into the right atrium, where an organized thrombus was found (Fig. 3B). This was longitudinally sectioned until finding any blood drainage. The vena cava lumen was enlarged with a pericardial patch (Fig. 3C).

Pathological study reported fibrin with abundant hyphae morphologically compatible with *Aspergillus sp.* A post-operative CT scan documented adequate permeability of both the pulmonary artery and the superior vena cava (Fig. 4).

The evolution after the surgical procedure has been successful. The patient is still under medical treatment with antifungal treatment as well as serial galactomannan detection control to monitor the fungal process.

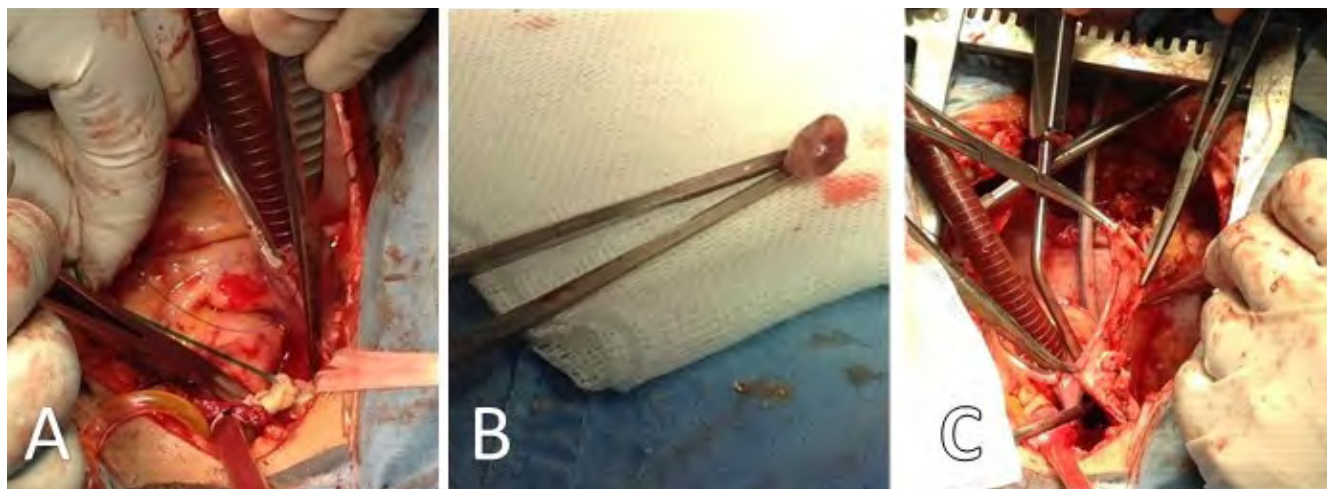


Figure 3. A. An image compatible with a thrombus is observed at the level of the superior vena cava which emerges into the right atrium. B. Thrombus compatible with Aspergilloma confirmed by histopathological study. C. Reconstruction of the right pulmonary artery with an autologous pericardium patch.

**COMMENT**

Aspergillus is the source of approximately 20-30% of all cases of fungal endocarditis [6]. The main clinical features associated with Aspergillus endocarditis are fever, a changing cardiac murmur, embolization of arterial vessels, a large valvular vegetation and negative blood culture results [7].

Most patients diagnosed as Aspergillus endocarditis are male and have a predisposing condition [8]. However, among children, congenital heart disease is the most common risk factor [7]. The diagnosis of Aspergillus endocarditis requires a high index of suspicion. Barst et al. reported that the diagnosis had been established after death in 21% of reported cases, but blood cultures were generally negative and vascular vegetations were frequently large, around 96% [9].

Optimal management of Aspergillus endocarditis remains a difficult subject and a combined medical and surgical approach is often proposed. However, despite advances in surgical procedures and the development of new antifungal agents, the mortality rate remains considerably high. Two cases of Aspergillus endocarditis were reported by Nikolousis and Velangi [10]. In the first case, Amphotericin B Liposomal together with Voriconazole brought to light the Aspergillus endocarditis solution in one month without the need for surgical intervention, but the second case required urgent resection of the Aspergilloma along with a combined antifungal therapy due to cardiocirculatory compromise.

Despite the fact that our patient required intensive care treatment, the final result was good. The main predisposing conditions exhibited by our case were the evolution of Hodking's lymphoma and multi-invasion with central venous

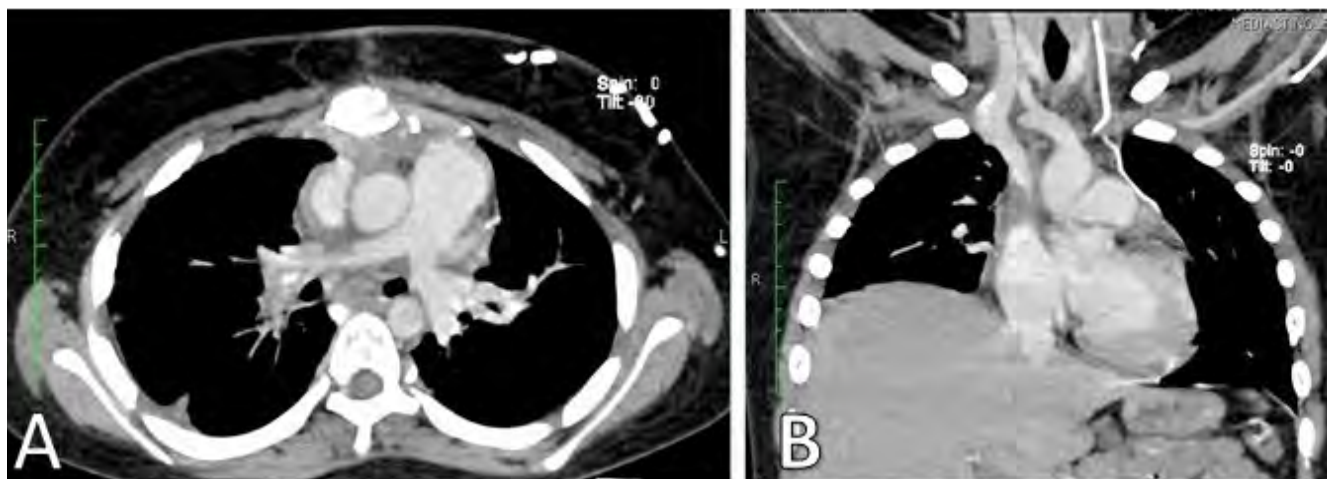


Figure 4. A. Contrast chest CT where the permeability of the right pulmonary artery is observed after surgical reconstruction. B. Contrast coronal section CT scan showing the permeability of the superior vena cava after the surgical reconstruction.

catheters used for chemotherapy treatments. He had received several doses of immunosuppressive treatment, but not having any congenital heart disease.

The combined therapy is the most indicated in patients with fungal endocarditis and, if it is associated with an early diagnosis and an adequate immune system, it could be decisive in the favourable evolution. However, the prognosis for *Aspergillus* endocarditis remains uncertain and confused.

The mortality of filamentous fungal endocarditis, regardless of the treatment received, is of 80-96%. Unlike information reported in the literature, the combined treatment of *Aspergillus* endocarditis in our patient has been successful and the oncological and infectious problems are under control.

As a conclusion, the treatment modality for patients with infective *Aspergillus* endocarditis includes surgery as well as standard medical treatment. Radical debridement of necrotic tissues combined with valve replacement by means of autologous tissue is the preferred surgical procedure. However, the results have been disappointing with only a limited number of survivors reported on literature. Therefore, a multidisciplinary approach is advisable for the primary prevention of the disease.

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