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Case Report

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Intracardiac Aspergilloma in a Case with Premature Birth: A Case Report

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Abstract

Aspergillus species, which are common in nature, can cause a highly variable spectrum from allergy to invasive disease, depending on the host's immunity and the presence of underlying lung disease. Isolated cardiac aspergilloma is extremely rare without fungal sepsis. In this case, cardiac aspergilloma in a preterm baby has presented. This premature baby born thirty-two weeks and 1000 gr, and hospitalized due to sepsis. She was operated after a mass and thrombus were detected in the echocardiography while receiving antibiotic therapy. During the operation, an intracardiac mass excision was made in the right atrium, starting from the inferior vena cava, measuring 9 x 10 mm (18 mm with the stem). The pathology result was compatible with aspergilloma, and Aspergillus colonization was detected in the myocardial tissue, which was also supported by the pathology laboratory. No growth was detected in blood cultures, and immunological examinations were found to be normal. Low molecular weight heparin and levatirecetam treatments were given to the patient who developed cardiac arrest, seizures, and multiple thrombi during the follow-up. At the end of eight months, the patient was discharged without sequelae, and voriconazole treatment was completed for 12 months. Outpatient follow-up continues. The immaturity of the phagocytic system and T cell-mediated immune system of premature babies, their need for long-term parenteral nutrition, the use of broad-spectrum antibiotics and steroids put these babies at risk for invasive fungal infections.

Keywords: Aspergilloma, Heart, Prematurity, Voriconazole

Introduction

Aspergillus species, which are common in nature, are highly variable from allergy to invasive disease, depending on the host's immunity and the presence of underlying lung disease. This can cause different conditions [1]. In Aspergillosis, symptoms of pulmonary or extra-pulmonary (skin, sinus, cerebrum, heart) involvement caused by *Aspergillus* species can be seen. Isolated cardiac aspergilloma is extremely rare without fungal sepsis. In this case, a baby with cardiac aspergilloma, who was born prematurely and spent his whole life in the hospital until the eighth month after birth, was presented.

Case

The case was born from the second pregnancy of a 33-year-old mother by cesarean section at 32 weeks of gestation in a state hospital with a weight of 1000g. She was intubated due to respiratory distress at birth and transferred to the intensive care unit. The patient was fed with lipid total parenteral nutrition (TPN) and received antibiotherapy (ampicillin and gentamicin) by an umbilical vein catheter. Incubator oxygen was started on the fifth day of hospitalization. PFO (patent foramen ovale) was detected in the echocardiography performed routinely during the follow-ups of the intensive care unit. The patient's general condition was good and her vital signs were stable. The patient's antibiotherapy was discontinued on the seventh day of hospitalization. The patient was followed up with a decrease in tone, groaning, increased respiratory rate, nasal flaring, cyanosis, apnea, vomiting and poor circulation. Vancomycin, meropenem and fluconazole were started due to sepsis. In the second echocardiography on the 38th day of life, a mobile mass in the tricuspid valve on the atrium has detected. Fluconazole therapy switched to liposomal amphotericin B. No growth was detected in the blood cultures. There was no additional sign for infective endocarditis. Despite one month of treatment, the cardiac mass did not decrease, so the patient has operated. In this operation, a 9 x 10 mm (18 mm with stem) mass was excised, starting from the inferior vena cava in the right atrium. Because of pathology, *Aspergillus*-specific septal hyphae seen. The diagnosis was confirmed by mycological culture.

On Tran's fontanel ultrasound examination, bilateral extra axial CSF (cerebro spinal fluid) distance increase and hydrocephalus on the left lateral ventricle were detected. Levatiracetam treatment

was started. On immune examination, lymphocyte sub groups, immunoglobulin G, A, M, burst supresyon test, Di George genetics, and primary immunodeficiency panel was normal. Primary immune deficiency was not detected. He was transferred to the Pediatric Intensive Care Unit (PICU) due to respiratory distress and poor general condition. The patient was intubated in the intensive care unit, could not be weaned from the mechanical ventilator for a long time so chronic lung disease has occurred. In the intensive care follow-up of the patient, an appearance compatible with 4*5 mm vegetation was found in the superior vena cava in the control echocardiography. The patient was brought to the council with the Thoracic and Cardiovascular Surgery Department and the continuation of the medical treatment was recommended. On the follow up, she had cardiac arrest three times lasting for maximum 5 minutes. In the brain tomography, the ventricles were wide, the extra ventricular subdural space was enlarged, and the corpus collosum was thin. No pulmonary embolism was detected in the thorax CT. Upper lobes collapsed in both lungs, ground glass areas were detected in middle and lower lobes and atelectasis areas were detected in basals. After PICU follow up, the patient transferred to the ward. In the follow-up, voricanozol treatment was switched to oral. At the end of eight months, the patient was discharged without sequelae, and voriconazole treatment was completed for 12 months. The patient, whose outpatient follow-up continues, has normal mental motor development, and the pediatric neurology department discontinued his antiepileptic drug.

Discussion

Fungal infections are associated with high mortality and morbidity in newborns, which is one of the major causes of infection. With the developing technology in the last 20 years, the life expectancy of premature babies has increased despite lower gestational weeks. The increase in the use of invasive interventions, mechanical ventilation applications, central catheters and broad-spectrum antibiotics in neonatal intensive care units has led to an increase in the frequency of fungal infections. Also, newborns' immune systems have not yet improved due to prematurity and they have intensive care-related risk factors (mechanical ventilation, total parenteral nutrition, oral feeding, broad-spectrum antibiotic use) [2, 3]. The most common invasive fungal infections are due to Candida and Aspergillus species, and the most common cause in newborns is Candida spp infections [4-6].

Most fungal infections in premature newborns are due to *Candida* species (spp); also rarely, *Malassezia, Zygomycetes or Aspergillus* spp. can be seen. Filamentous fungi or molds cause aspergillosis and mucormycosis. Although rarely, *Candida* spp., Aspergillozis and mucoymycosis can cause severe cutaneous infections in preterm infants [7-11]. In our patient, she had no cutaeous sign but she had an umbilical vein catheter. She could be contaminated while the catheterization. However, in the blood cultures, there were no *Aspergillus* spp was detected. *Aspergillus* fumigatus is responsible for more than 90% of invasive aspergillosis cases [12]. However, in our case, subgroup determination could not be made. Environmental contamination of dust from hospital construction or improper ventilation can carry *Aspergillus* spores that can settle in wounds or be inhaled. Regular cleaning of ventilation systems in the neonatal intensive care unit (NICU) can prevent spores from accumulating and properly dusting (usually on ceilings) during hospital renovation and construction. Within the scope of the infectious disease control program in our hospital, there is a ventilation system that gives out 100% of the room air with negative air pressure. The walls, ceiling and floors were covered with a hermetically compressed material and had self-closing doors. While our patient was in the hospital, no construction was done in the wards where he stayed.

Extreme preterm delivery and neutropenia are major risk factors for mucormycosis in the NICU. Mucor infections can often develop into necrotizing soft tissue infections. Fungal culture or tissue biopsy can identify these right-angled, branched, undivided hyphae [13-15]. Infection with *Malassezia* organisms is similar to that seen with invasive candidiasis. *Malassezia furfur* is a lipid-dependent fungus that can colonize central venous catheters when lipid emulsions are infused. Malassezia can also colonize the skin and gastrointestinal (GI) tract. It has been reported to cause sepsis, urinary tract infection and meningitis in very low birth weight (VLBW) infants, but not in other neonates. Fungal markers such as polymerase chain reaction (PCR) and beta-glucan can be extremely helpful in diagnosing and monitoring the response to treatment of fungal infections [16, 17]. Galactomannan and beta-glucan tests could not be performed in our case because there was no kit sample. Aspergillosis can cause respiratory failure, liver failure, seizures and skin lesions; also, the organism has a tendency to invade blood vessels, causing thrombosis, infarction and necrosis [6]. Intracardiac Aspergillus infection, which is rarely seen in the literature, has been shown in our case, and there are risk factors for invasive fungal infection such as prolonged use of broad-spectrum antibiotics, low birth weight, central venous catheter, and TPN. The first control echocardiography of our patient was normal, and on the second echocardiography performed on the 30th day of hospitalization, a mass was detected which could be due to sepsis or prematurity.

Conclusion

As a result, the patient's condition started on the 30th day of hospitalization. She was followed up and treated in the hospital from birth to 8 months old. The definitive diagnosis in our case was intracardiac aspergilloma. From tissue samples, Aspergillozis confirmed by pathological method. It was placed because of pathological direct material examination from the vegetation. This result shows that both early diagnosis and surgical debridement with antifungal treatment, shows its importance in reducing mortality.

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