Potentially fatal tricuspid valve aspergilloma detected after laparoscopic abdominal surgery

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Abstract

Fungal endocarditis accounts for 1.3-6% of all cases of infective endocarditis. The most common causative organism is Candida, followed by Aspergillus and other mould fungi. Aspergillus endocarditis is usually associated with high morbidity and mortality. Establishing a definitive and timely diagnosis remains difficult and there are many reports of undetected aspergillomas leading to fatalities in the perioperative period. We present a case report of preoperatively undiagnosed large mobile tricuspid valve aspergilloma obstructing the right ventricular inlet, diagnosed incidentally on the second postoperative day after laparoscopic pancreatic abscess drainage. The patient was successfully managed with emergency open-heart surgery and systemic antifungal agents in the postoperative period.

Introduction

Although rare, fungal endocarditis is one of the most severe forms of infective endocarditis.[1] In the absence of intravenous drug addiction, isolated nonrheumatic fungal native tricuspid valve (TV) endocarditis is even rarer.[2] Data in the literature suggest that Aspergillus and other fungi cause larger and more friable vegetations than bacteria. We report a case of a large mobile aspergilloma of native TV that was detected incidentally in the postoperative period after laparoscopic pancreatic abscess drainage. The patient was managed with emergency open-heart surgery and systemic antifungal agents in the postoperative period.

Case study

A 26-year-old man was referred to our hospital complaining of severe right upper quadrant abdominal pain. He had a history of hospitalisation (in a peripheral hospital six months previously), where he was diagnosed with acute pancreatitis. This was managed conservatively. Following this episode, the patient experienced intermittent fever, sometimes of high grade, for the last four of the six months. During this period, he was treated at various hospitals and managed with multiple intravenous antibiotics. The patient related a history of heavy alcohol consumption, heavy smoking and opium abuse over a period of five years, lasting until six months prior to his admission.

On examination, his heart rate was 124 beats per minute, blood pressure was 124/66 mmHg and temperature was 37.3°C. Jaundice and pallor were present. On systemic examination, he had reduced breathing in the right basal region of the chest. Cardiovascular examination was normal and there were no cardiac murmurs. On abdominal examination, there was guarding and tenderness in the right upper quadrant. Blood investigations revealed a haemoglobin concentration of 8.7 g/dl, total leucocyte count of 18 100/mm³, platelet count of 77×10^3/mm³, prothrombin time of 17.5 seconds (international normalised ratio 1.42) and a serum bilirubin of 54.7 mmol/l. Serum amylase and lipase were normal. Other haematological and biochemical investigations were within normal limits. Blood cultures remained negative. The chest X-ray showed signs of pleural effusion, with adjoining segmental collapse consolidation in the right basal region. On ultrasound examination of the abdomen, a large collection was seen in the lesser sac, extending along the right flank into the pelvis. The pancreas could not be visualised. Contrast-enhanced computed tomography revealed necrotising pancreatitis with

a peripancreatic abscess. Because the patient was a young man, and there was no history or clinical findings suggesting cardiac disease, a detailed cardiovascular examination was not conducted.

The patient underwent laparoscopic drainage of the pancreatic abscess, and removal of the necrosed area under general anaesthesia. The intraoperative course was uneventful and the patient was extubated on the operating table. The patient had an uneventful postoperative course until the second postoperative day, when he suddenly had an episode of bradycardia with syncope, managed with intravenous atropine 0.5 mg. In the next 30 minutes, the patient experienced another bradycardia episode, but this time it resolved spontaneously, requiring no pharmacological intervention.

Echocardiography showed a large echogenic mobile mass attached to the TV, which was thought to be a myxoma. The mass was being pushed towards the right ventricle with atrial contractions, potentially occluding the right ventricular inlet (Figure 1). Mild tricuspid regurgitation was present.

The patient underwent emergency open-heart surgery. Intraoperatively, the heart was oedematous and straw-coloured pleural and pericardial effusions were present. On opening the right atrium, a large friable mass measuring 2 × 2 cm was visible. The mass was attached to the ventricular aspect of the posterior TV leaflet, and the whole leaflet was tethered within the mass. The mass was removed and the posterior leaflet of the TV was excised. A posterior annuloplasty of the TV was done. Histopathology of the mass revealed it to be an aspergilloma. The patient received

intravenous caspofungin, in addition to other supportive treatment in the postoperative period. The patient had an uneventful postoperative course and was discharged from the hospital after seven days.

Discussion

Fungal infections account for 1.3-6% of all cases of infective endocarditis.[3] The most common fungal organisms causing endocarditis are Candida (62%), followed by Aspergillus (18%).[4] The predisposition of patients to these infections has increased due to intravenous drug abuse, long-term antibiotic therapy, steroid administration, chemotherapy, immunosuppressive states and open-heart surgery.[5-8] Men are more frequently affected than women, with peak incidences occurring between the third and fourth decades of life.[8] Aspergillus endocarditis is usually associated with high morbidity and mortality, ranging from 80-96%, regardless of the treatment. In many of the case reports in the literature, large undetected aspergillomas have resulted in fatalities in the intraoperative and postoperative periods, with the diagnosis being completed at the autopsy.[9] Unfortunately, a definitive and timely diagnosis cannot always be made. Fever is the most common symptom, but other signs of infective endocarditis, including murmur, splenomegaly and Roth's spots, may be absent. The leucocyte count is elevated in only 60% of the cases.[8,10] Conventional diagnostic tools such as blood culture and echocardiography are usually inconclusive with regard to early detection of Aspergillus endocarditis.[10] It has been shown that fungal blood cultures used to detect Aspergillus are negative in more than 50% of patients.[1,7,9-11] Availability of the galactomannan enzyme immunoassay (EIA) test may contribute substantially toward a non-culture-based diagnosis of invasive aspergillosis. Other potential circulating markers for detection include $(1\rightarrow3)$-β-D-glucans detected by the Tachypleus or Limulus assay. Polymerase chain reaction (PCR) based diagnosis, with amplified Aspergillus-specific fungal genes (usually ribosomal DNA genes), has shown considerable promise in the detection of invasive aspergillosis. However, these systems have not been standardised, are not commercially available and remain under investigation.[12] The large Aspergillus vegetations on a native TV in the patient in this case report might have been the result of his being chronically ill, and due to prolonged administration of multiple intravenous antibiotics. The patient described a history of prolonged fever, but as the cardiovascular examination was normal, and blood cultures were negative, the illness was attributed to the abscess in the peripancreatic area.
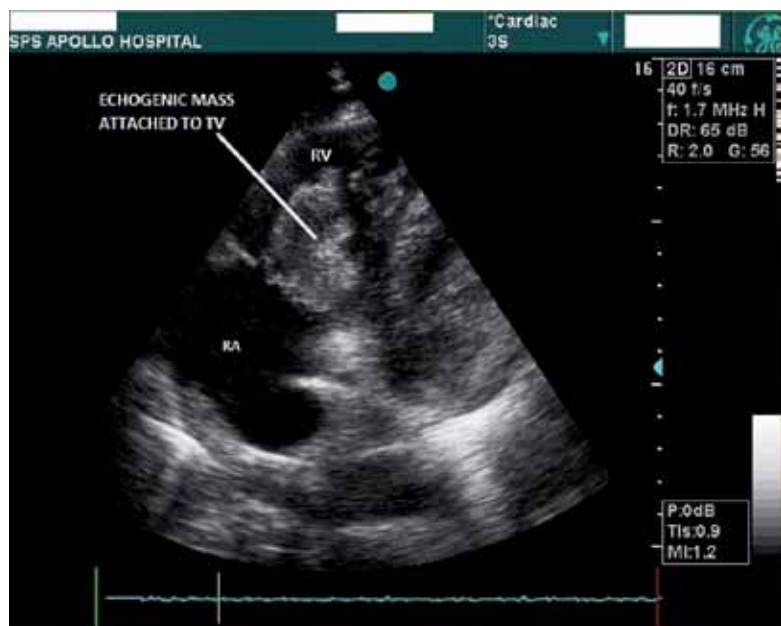

Figure 1: Echocardiograph showing large echogenic mass in the right atrium attached to the tricuspid valve, and obstructing the right ventricular inlet (RA = right atrium, RV = right ventricle, TV = tricuspid valve)

Various systemic antifungal agents have been recommended for the treatment of fungal endocarditis.[1,3,9,13] Historically, amphotericin B has been recommended as the preferred initial treatment, and should be continued for at least six weeks after surgical intervention.[12] Voriconazole is another drug, belonging to the antifungal triazoles, that has been approved by the US Food and Drug Administration for the primary treatment of invasive aspergillosis.[12] Although controversial, there have been case reports detailing how antifungal triazoles have been combined with amphotericin B in the treatment of Aspergillus endocarditis.[2,13] The role of new echinocandins, such as caspofungin, has recently been approved for treatment of probable or proven invasive aspergillosis. A possible combination of voriconazole with caspofungin has led to promising results in invasive pulmonary aspergillosis, but there is limited experience in patients with endocarditis.[2]

Systemic antifungal agents do not achieve good penetration into the necrosed and friable vegetations. These large vegetations can cause partial or total occlusion of the heart chambers or valves.[3,9,14] Furthermore, the friability of these vegetations favours multiple, small emboli or embolisation of the large fungal ball. This has been reported in post mortem case studies, where large aspergillus masses are seen to obstruct the main pulmonary artery.[1,7,8,15] These factors usually make medical treatment alone an unsatisfactory option, and a combined medical and surgical approach has been recommended.[2] Total tricuspid valvutectomy, followed by antifungal treatment, is the recommended management strategy for patients with tricuspid endocarditis.[2] The patient in this case report had two episodes of symptomatic bradycardia and was subjected to emergency open-heart surgery, followed by intravenous caspofungin in the postoperative period. Operation was expedited because of the concerns that the large mobile mass would cause total obstruction of the right ventricular inlet, or embolise to the main pulmonary artery.

In conclusion, Aspergillus endocarditis is a rare, but emerging disease. Difficulty in timely diagnosis and management can lead to high morbidity and mortality, especially in the perioperative period. Therefore, proceeding with caution and vigilance is recommended for patients who present with a history of prolonged fever, intravenous drug abuse, multiple antibiotic administrations, steroid overuse, chemotherapy, and other immunosuppressed states. Early treatment, in the form of medical and/or surgical intervention, must be instituted to improve the survival of these patients.

Declarations

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