Right-sided endocarditis secondary to a peritoneovenous shunt

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A 51-year-old woman with a peritoneovenous shunt for refractory ascites presented with three months of increasing fatigue, exertional dyspnea, night sweats and positive blood cultures. Imaging revealed multiple pulmonary emboli. Transthoracic echocardiography demonstrated moderate tricuspid regurgitation and a large pedunculated right atrial mass attached to the interatrial septum. The echocardiographic appearance remained unchanged after one month of antibiotic therapy and anticoagulation. Intraoperatively, the mass was easily excised and the grossly abnormal tricuspid valve replaced. Pathology revealed endocarditis with multiple bacterial colonies, and fibromyxoid changes consistent with postinflammatory valve disease.

Key Words: Endocarditis; Pulmonary embolism; Tricuspid valve

A 51-year-old woman presented with three months of increasing fatigue, New York Heart Association class III dyspnea, intermittent rigors and night sweats. Her medical history was significant for polycystic liver disease requiring left hepatic lobectomy and right segmental resection five years earlier. Subsequent refractory ascites resulted in placement of a peritoneovenous (LeVeen) shunt.

Nuclear imaging revealed multiple ventilation-perfusion segmental mismatches and a computed tomography scan confirmed bilateral peripheral pulmonary emboli. Blood cultures were positive for peptostreptococcus, micrococcus and coagulase-negative staphylococci. Vancomycin was started empirically and switched to cloxacillin once sensitivity results became available. Abdominal ultrasound demonstrated a normal functioning peritoneovenous shunt.

Transthoracic echocardiography demonstrated a 6 cm × 1.7 cm pedunculated right atrial mass attached to the interatrial septum, moderate tricuspid regurgitation and moderate pulmonary hypertension (Figure 1). Transesophageal echocardiography was not performed due

Figure 1) Preoperative transthoracic echocardiography. LA Left atrium; LV Left ventricle; M Mass herniating through the tricuspid valve; RA Right atrium; RV Right ventricle

Endocardite droite secondaire à un shunt péritonéoveineux

Une femme de 51 ans, porteuse d'un shunt péritonéoveineux pour ascites réfractaire, a consulté pour fatigue croissante, dyspnée d'effort, diaphorèse nocturne depuis trois mois et hémocultures positives. L'imagerie a révélé de multiples embolies pulmonaires. L'échocardiographie transthoracique a pour sa part mis au jour une régurgitation tricuspiddienne modérée et une volumineuse masse auriculaire droite pédonculée attachée au septum interauriculaire. L'aspect échocardiographique est resté inchangé après un mois d'antibiothérapie et d'anticoagulothérapie. Lors d'une intervention, la masse a facilement pu être excisée et la valvule tricuspiddienne manifestement anormale a pu être remplacée. L'examen anatomopathologique a révélé la présence d'une endocardite hébergeant plusieurs colonies bactériennes et des anomalies fibromyxoides concordant avec une maladie valvulaire post-inflammatoire.

to esophageal varices. The differential diagnosis included organized thrombus, cardiac tumour, infectious endocarditis and pseudocyst. Chest and abdominal computed tomography imaging ruled out non-cardiac malignancy. A trial of intravenous antibiotics and anticoagulation was initiated. Repeat blood cultures at four weeks were negative. Repeat echocardiography at one month, however, demonstrated no change in mass size.

Given the risk of further embolization and the lack of clinical and echocardiographic response to medical therapy, the patient elected to undergo surgery. Intraoperatively, cardiopulmonary bypass was initiated with bicaval cannulation. The aorta was cross-clamped and cardiac arrest was achieved using warm blood cardioplegia. The mass was approached through the right atrium. Gross examination revealed a polypoid 6 cm × 2.8 cm × 1.5 cm tan-coloured lesion, with a narrow avascular stalk attaching it to the interatrial septum. The peritoneovenous shunt extended 2 cm into the right atrium, but was free of vegetations. The mass was easily excised at the level of the stalk (Figure 2). Examination revealed a grossly abnormal tricuspid valve with marked thickening of the septal leaflet. Thus, the tricuspid valve was replaced with a 29 mm St Jude Epic bioprosthesis (St Jude Medical, USA). Additionally, the peritoneovenous shunt was transected at the level of the distal superior vena cava and sent for culture.

Pathological examination of the mass revealed an endocardial vegetation with multiple bacterial colonies (cocci). The native tricuspid valve demonstrated changes consistent with postinflammatory valve disease. Cultures from the tip of the peritoneovenous shunt were negative.

The patient's postoperative course was complicated by hemorrhage and a prolonged stay in the intensive care unit. She remained on intravenous cloxacillin for another eight weeks. The patient's intermittent fevers and rigors persisted postoperatively until the peritoneovenous shunt was eventually removed. Before discharge, a transjugular intrahepatic portosystemic shunt was placed for management of ascites. At the six-month follow-up, the patient was clinically well with no evidence of recurrent endocarditis. She has been offered consideration for liver transplantation.

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DISCUSSION

The LeVeen shunt is a peritoneovenous shunt indicated for patients with refractory ascites. One end of the shunt is inserted percutaneously into the peritoneal cavity. The other end is tunneled subcutaneously into the neck and inserted into the right atrium via the internal jugular vein. Complications of peritoneovenous shunts include fever, disseminated intravascular coagulopathy, shunt occlusion, hypokalemia, infection, variceal hemorrhage, bowel obstruction, pulmonary edema, air embolism and pneumothorax.

The current literature is limited to a few case reports (1-5) of right-sided endocarditis in patients with peritoneovenous shunts, often discovered at autopsy. There are three case reports (1,3,5) in which the peritoneovenous shunt was removed; one of these patients (5) also underwent tricuspid valvectomy and thrombectomy.

To the best of our knowledge, there are no previous reports of successful removal of a right atrial mass and tricuspid valve replacement for endocarditis secondary to a peritoneovenous shunt. The decision to proceed with surgery in this patient with multiple comorbidities was based on the lack of clinical and echocardiographic improvement despite prolonged intravenous antibiotics and anticoagulation.

Although the shunt tip culture was negative, its location in the right atrium suggests that it was responsible for endocardial damage of the interatrial septum and subsequent endocarditis. Because the patient remained febrile postoperatively with positive blood cultures, the shunt was eventually removed. In the previously described cases, all patients with a peritoneovenous shunt left in situ died, while two of the three patients with the shunt removed survived.

CONCLUSION

We report the first successful case of right atrial mass excision and tricuspid valve replacement for endocarditis in the setting of a peritoneovenous shunt. Based on our limited experience, we suggest that peritoneovenous shunts be removed as soon as possible to eliminate the source of infection in these cases. The decision to proceed with surgery should be based on clinical presentation and individual patient risk factors.

Figure 2) Right atrial mass postexcision

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