CASE REPORT

Very late-onset lead-associated endocarditis

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Lead-associated endocarditis is a serious complication due to device implantation. The present article reports on a case involving a 57-year-old man with microbiologically and pathologically confirmed lead-associated endocarditis caused by *Staphylococcus capitis*. Transesophageal echocardiography is essential for diagnosis, and treatment usually requires appropriate antibiotics and removal of the lead.

Key Words: *Bacterial; Defibrillator; Endocarditis; Implantable; Staphylococcus*

Une endocardite à apparition très tardive associée au plomb

L'endocardite associée au plomb est une grave complication attribuable à l'implantation d'un dispositif. Le présent article expose le cas d'un homme de 57 ans atteint d'une endocardite associée au plomb causée par un *Staphylococcus capitis*, confirmée sur le plan microbiologique et pathologique. L'échocardiographie transœsophagienne est essentielle au diagnostic, et le traitement exige généralement la prise d'antibiotiques pertinents et le retrait du plomb.

The recent increase in the use of permanent pacemakers (PPMs) and implantable cardioverter-defibrillators (ICDs) has been accompanied by an increased incidence of various complications. Lead-associated endocarditis (LAE) is a serious infectious complication, primarily caused by coagulase-negative staphylococci, with *Staphylococcus epidermidis* being the principal infectious agent (1,2). We describe a patient with microbiologically and pathologically confirmed ICD-LAE due to *Staphylococcus capitis*.

CASE PRESENTATION

A 57-year-old man was admitted to the hospital for intermittent chilling over a period of eight months. Seven years earlier, the patient had been diagnosed with Brugada syndrome, for which an ICD was inserted, with the generator changed two years earlier.

Eight months earlier, the patient experienced intermittent chilling sensations once or twice per month. He took acetaminophen intermittently and was not prescribed antibiotics before admission. On physical examination, his vital signs were stable (blood pressure 109/66 mmHg, heart rate 50 beats/min, respiratory rate 20 breaths/min and body temperature 36.2°C), and no inflammatory focus was found. The skin overlying the ICD was clear, without any signs of infection. A complete blood cell count at admission revealed leukocytosis (white blood cell count 30.8×10^9/L and 87.5% neutrophils), as well as elevated C-reactive protein concentration (82.5 mg/L) and erythrocyte sedimentation rate (34 mm/h). Initial chest roentgenography was within the normal range, except for ICD in situ. Three days after hospital admission, he developed a low-grade fever (37.7°C). Computed tomography showed multiple nodular consolidations in both upper lung fields. Due to suspicion of infective endocarditis, the patient underwent a transesophageal echocardiogram, which showed a 26 mm × 17 mm round-shaped mass-like lesion on the ICD lead (Figure 1). Vancomycin was prescribed on suspicion of LAE.

On hospital day 7, *S capitis* was found growing in three cultures of blood drawn at the time of the patient's admission to the hospital.

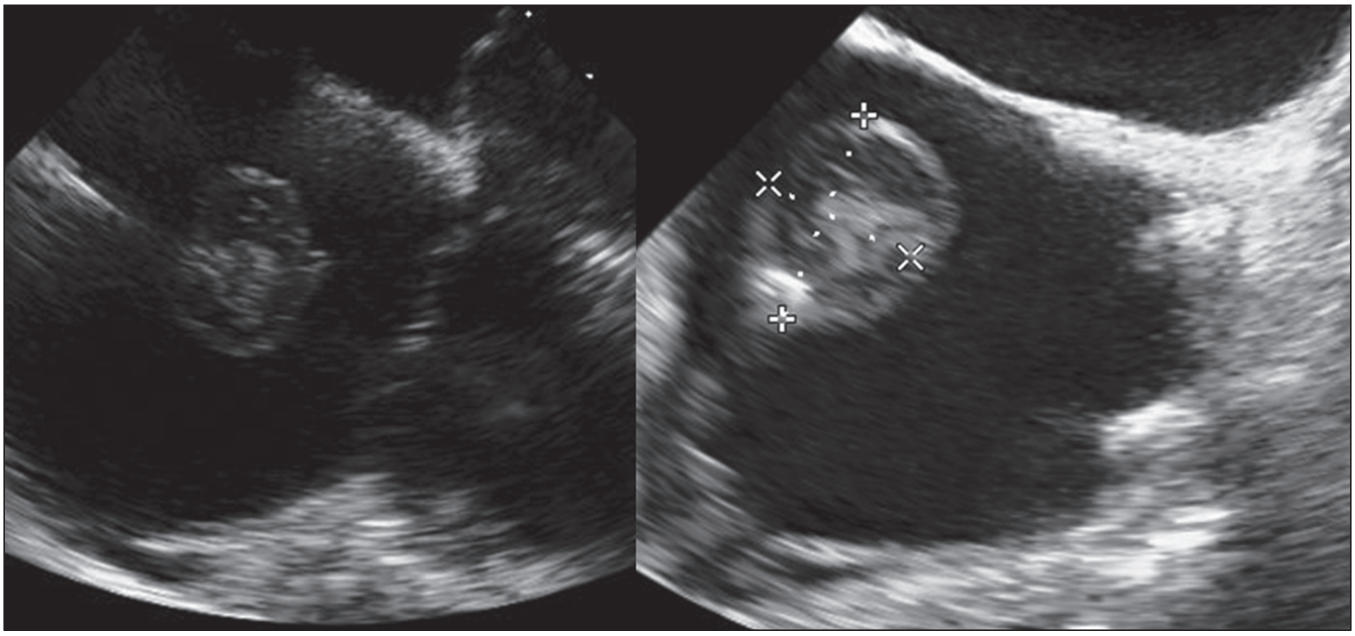

Figure 1) *Transesophageal echocardiogram showing a round-shaped, smooth-surfaced, 17 mm × 26 mm size lesion in the patient*

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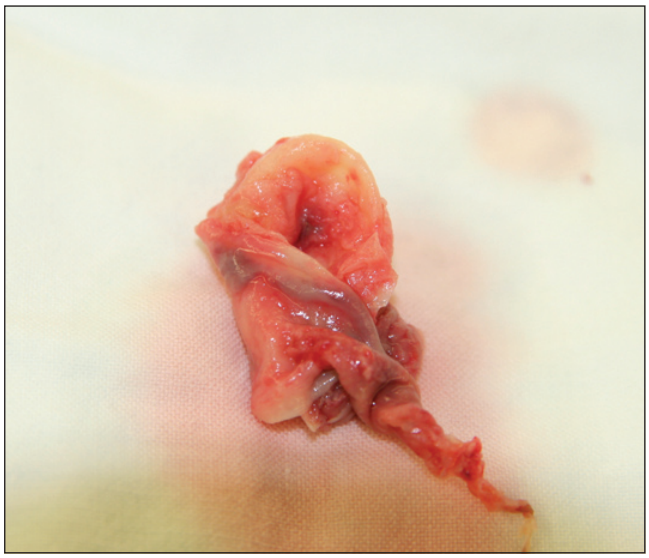

Figure 2) *Surgical specimen. The mass adhered to the atrial part of the lead*

Because this organism is methicillin sensitive, treatment began with nafcillin. On hospital day 10, the same species was found growing in three cultures of blood that were drawn on hospital day 3. Despite antibiotic treatment, however, the patient's fever and inflammatory parameters became exacerbated. On hospital day 10, the lead was extracted by mini-thoracotomy and extracorporeal circulation. After incision of the right atrium, thrombi and growing redundant tissue were observed adhering to the ICD lead around the tricuspid valve. This tissue was removed and sent to the microbiology laboratory. *S capitis* was grown from these surgical specimens (Figure 2). Because it was difficult to extract the entire lead due to severe adhesion to the right ventricle, the lead was cut (leaving the remaining distal tip) and removed. The patient was continued on nafcillin for a total of six weeks. Follow-up blood cultures were sterile. On hospital day 28, after being afebrile for three weeks, an ICD was reinserted.

DISCUSSION

The incidence of infection following ICD or PPM implantation has been reported to range from 1% to 1.9% (3,4), with mortality rates in infected patients as high as 20% (5). The most common pathogen is *S epidermidis* (2,6); *S capitis* has been reported in only two patients with LAE to date (7,8). The time intervals between implantation and onset of diagnosis in these two patients were three years and 15 years, respectively, with the pathogens growing within three days (7,8). Our patient was more difficult to diagnose because of the very late onset of LAE (seven years after lead insertion), his nonspecific symptoms, the absence of pocket infections and the long incubation period (seven days). In most patients with LAE, it is necessary to extract the lead because of the high rates of morbidity and mortality in the absence of extraction (9). We found that minimally invasive surgical procedures and subsequent treatment with appropriate antibiotics were successful in the present patient.

The diagnosis of LAE is often difficult due to its nonspecific presentations without a demonstrated focus of infection, and inappropriate management may result in high morbidity and mortality rates. Patients with PPM or ICD-associated infection should, therefore, be managed carefully and followed-up frequently. Diagnostic examinations should include transesophageal echocardiography and blood cultures for a sufficient incubation period. Appropriate surgical management should not be delayed in patients with LAE.

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