

Mitral Valve Abscess due to Infective Endocarditis Detected by Computed Tomography

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Perivalvular abscess or intracardiac fistula formation is usually considered a complication of infective endocarditis at a native aortic valve or prosthetic valve. The incidence of myocardial abscess is probably higher than presumed. In one study, echocardiography detected myocardial abscess in only 40% of surgically proven abscesses. Nearly half of them were localized on the posterior part of the mitral annulus [1], indicating a significant preoperative underestimation of the extent of cardiac involvement.

Myocardial abscess can manifest in a variety of clinical scenarios, ranging from an asymptomatic state to catastrophic myocardial wall rupture. Perivalvular abscess is usually suspected in a patient with a well-established infective endocarditis and persistent fever despite appropriate antimicrobial therapy. New-onset and persistent electrocardiographic conduction abnormalities are relatively specific. Transesophageal echocardiography is the examination of choice for detecting an abscess, and color Doppler is the preferred modality for defining a fistula [2].

We describe a perivalvular abscess as an unusual complication of mitral valve endocarditis detected on thoracic

CT in a patient in whom TEE was initially negative.

PATIENT DESCRIPTION

A 77 year old woman was admitted to our geriatrics department with intermittent high fever, poor general condition, and new onset of right hip pain and difficulty in walking. Her medical history included aortic valve replacement (bioprosthetic) 5 years previously, paroxysmal atrial fibrillation, diabetes mellitus and hypertension, and was negative for prior endocarditis, drug abuse and recent dental intervention. On admission, the patient was alert and oriented but appeared ill. She had a temperature of 39.0°C, blood pressure of 100/60 mmHg, pulse rate 80/min, and respiratory rate 20/min.

Physical examination revealed a grade 2/6 systolic murmur over the cardiac apex and an intense lower back and right hip sensitivity. There were no focal signs of infection and no peripheral secondary signs of endocarditis (i.e., conjunctival or retinal hemorrhage, petechiae, tender nodules, or Janeway lesions on the hands). Laboratory findings included leukocytosis 18,000/mm³ with neutrophilia (62.1%), C-reactive protein 15 mg/dl, and proteinuria 100 mg/ml without leukocyturia or hematuria. Electrocardiogram showed sinus rhythm without conduction abnormalities. No abnormalities were detected on chest, abdominal and hip radiography, or on abdominal ultrasound.

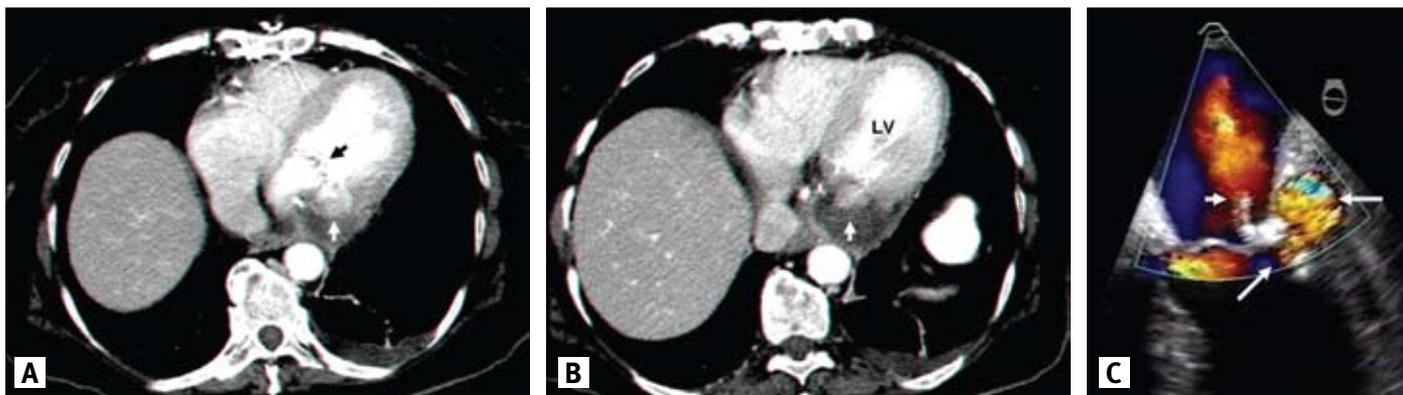
On the third day of hospitalization, three pairs of blood cultures were positive for *Staphylococcus aureus* and the patient was treated with intravenous cefazolin. Both a transthoracic echocardiogram and TEE were negative for endocarditis. Since the patient had a persistent fever and persistent right hip pain, the antibiotic was changed to vancomycin and a pelvic CT was performed, demonstrating a fracture in the sacral bone without signs of osteomyelitis. Radionuclide technetium-99 and gallium bone scans were also negative for infection.

A second TTE on the tenth day did not reveal any pathologic findings, and a contrast-enhanced thoraco-abdominal CT was performed to investigate the cause of the fever. On dual-slice CT, a contrast-filled pouch, 3.5 cm diameter, was found adjacent to a calcified mitral annulus, with a hypodense soft tissue periphery, bulging from the posterior wall of the left ventricle [Figure]. These findings were interpreted as a pseudoaneurysm of the left ventricle, suggesting the origin of the bacteremia. Subsequently, a second TEE demonstrated vegetation on the posterior mitral leaflet with a pseudoaneurysm, originating from the base of the posterior wall, probably the result of an abscess that drained into the ventricle.

The patient was treated conservatively, resulting in a gradual clinical and laboratory improvement. Two months later, a repeat TEE showed a decrease in the size of the vegetation. There was still blood flow into the pseudoaneu-

TEE = transesophageal echocardiography

TTE = transthoracic echocardiogram



[A] A 73 year old woman with *Staphylococcus aureus* bacteremia of unknown origin. A contrast-enhanced CT at the level of a calcified mitral valve (black arrow) shows a "pouch" of contrast (white arrow) surrounded by hypodense soft tissue density.

[B] Slightly caudal to [A], the origin of the "pouch" contrast material (white arrow) is from the posterior wall of the left ventricle (LV). A small amount of left pleural effusion is seen.

[C] TEE performed 3 weeks later demonstrates large mitral valve vegetation (arrow head) and a pseudoaneurysm originating at the basal part of the left ventricle with blood flow through its neck (white arrows).

rysm. The patient was discharged free of symptoms or complications.

COMMENT

Myocardial abscess in various anatomic locations of the heart has been described. These include the atrial auricle, free wall of the ventricles, perivalvular region, septal wall, and in a ventricular septal defect.

Myocardial abscess usually occurs in the setting of infective endocarditis, essentially aortic valve and prosthetic valve endocarditis, but it can also be found in septicemia without infective endocarditis. It can also occur as a complication of various clinical conditions, such as acute myocardial infarction, blunt trauma and penetrating injuries, following invasive cardiac procedures, left ventricular aneurysm infection, and infection of an atrial myxoma.

Annular extension of infection in a native valve is more common in aortic (41%) compared to mitral (6%) valve endocarditis. The reported incidence of perivalvular abscess in patients with infective endocarditis at surgery or autopsy is 30–40% [3].

The clinical picture of myocardial abscess varies and includes poor clinical response to antibiotics, cardiac arrhythmias, pericarditis, hemopericardium and congestive heart failure due to valvular regurgitation. Patients with infective endocarditis and perivalvular abscesses have higher rates of systemic embolization and fatal outcomes. Because of the variable clinical manifestations, which overlap with other disease states, the diagnosis of myocardial abscess is challenging. TEE is the imaging modality of choice for establishing a correct diagnosis.

Perivalvular abscess is usually suspected in patients already diagnosed with endocarditis. In our patient, there was no evidence of endocarditis on either TTE or TEE. Interestingly and unexpectedly, the diagnosis of a perivalvular abscess was suggested by CT and confirmed by repeat TEE. This emphasizes the need for a repeat TEE in any case where a clinical suspicion of endocarditis or an abscess remains high.

The role of thoraco-abdominal CT for evaluating fever of unknown origin is well known [4]. The role of cardiac gated CT for diagnosing infective endo-

carditis and myocardial abscess was first reported by Feuchtner et al. [5]. Their study showed that CT and TEE had similar accuracy in detecting vegetation, abscesses and pseudoaneurysms.

Although a non-dedicated CT was performed in our patient, it was sufficiently abnormal to warrant further evaluation by repeated TEE, even though there was no evidence of endocarditis, initially.

To conclude, although anecdotal, CT may be useful in the diagnosis of a perivalvular abscess even in the presence of a negative TEE, emphasizing its important role in evaluating patients with *Staphylococcus aureus* bacteremia whose primary site of infection is unknown.

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References

- Hill EE, Herijgers P, Claus P, et al. Infective endocarditis: changing epidemiology and predictors of 6 months mortality: a prospective cohort study. *Eur Heart J* 2007; 28: 196-203.
- Daniel WG, Mugge A, Martin RR, et al. Improvement

in the diagnosis of abscesses associated with endocarditis by transesophageal echocardiography. *N Engl J Med* 1991; 324: 795-800.

3. Arnett EN, Roberts WC. Valve ring abscess in active infective endocarditis: frequency, location, and clues to clinical diagnosis from the study of 95 necropsy patients. *Circulation* 1976;

54: 140-5.

4. Dupond JL. Fever of unknown origin: diagnostic strategies and tactical approaches. *Rev Med Interne* 2008; 29: 946-56.
5. Feuchtner GM, Stolzmann P, Dichtl W, et al. Multislice computed tomography in infective endocarditis. *J Am Coll Cardiol* 2009; 53: 436-44.

Erratum

In the article "Age-Related Immunoglobulin G Seroprevalence of Human Parvovirus B-19 in Israeli Children" that appeared in the May issue (Vol 12, p 277), a mistake occurred in the spelling of one of the authors' names. It should be Schlesinger and not Schelisinger as printed