Revealing Infective Endocarditis Complications by Echocardiography: The Value of Real-Time 3D Transesophageal Echocardiography

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A 72-year-old patient was admitted to the Department of Cardiology of Emory University Hospital with the diagnosis of infective endocarditis. Two-dimensional transesophageal echocardiography (TEE) showed a vegetation attached to the posterior mitral valve leaflet that led to severe mitral regurgitation. Real-time 3-dimensional TEE clearly identified the large posterior leaflet vegetation but additionally showed the perforated posterior mitral valve leaflet. Real time 3D TEE, and especially the large sector-focused data, allow for detailed identification of the mitral valve leaflets from both the atrial and the ventricular side. Those characteristics of real-time 3D TEE confer incremental value in assessing infective endocarditis lesions and complications.

Echocardiography has a fundamental role in the diagnosis of infective endocarditis, in the recognition of complications, and in surgical decision making. Here we describe a case where three-dimensional transesophageal echocardiography (TEE) was of added value in identifying complications.

Case presentation

A 72-year-old male patient was admitted to Emory University hospital with the diagnosis of infective endocarditis. A trans-thoracic echocardiogram (TTE) performed elsewhere showed a vegetation on the posterior leaflet of the mitral valve. The TTE was performed after his primary care physician heard a systolic heart murmur on auscultation. During the previous months the patient had multiple episodes of respiratory tract infection, one of which was considered to be pneumonia. He had received in total three courses of antibiotics. Approximately three months before his admission to our hospital he had dental work done. He was additionally treated for hypertension, hyperlipidemia, chronic anemia and glaucoma. On admission he mentioned having night sweats and chills over the previous months, as well as mild fatigue. His blood pressure was 135/90 mmHg, heart rate 85/min, O2 saturation 96%, and he was afebrile. On auscultation he had a 4/6 systolic heart murmur best heard on the apex, without additional heart sounds. His laboratory work showed mild anemia with a hematocrit of 37% and hemoglobin of 124 mg/dL, while his white blood cells and erythrocyte sedimentation rate were normal with values of 8100 and 17 mm/h. Two blood cultures were taken on that day, which were later positive for Streptococcus mutans. A transesophageal echocardiography (TEE) study was performed the next day and showed a severe mitral regurgitation jet directed anteriorly (Figure 1). The 2D TEE images also...
showed a mass attached to the posterior mitral valve leaflet measuring 2.17 cm at its maximal length (Figure 2), consistent with a vegetation. The real-time 3D TEE images of the mitral valve clearly showed the posterior leaflet vegetation (Figure 3). They additionally revealed a perforation of the posterior mitral valve leaflet when the mitral valve was seen from the left ventricular side (Figure 4).

The patient initially received vancomycin + gentamycin (gentamycin 80 mg iv three times a day for 2 weeks). He was switched to ceftriaxone 2 g × 1 iv one week after his admission to minimize the adverse effects of vancomycin. He remained hemodynamically stable during his hospital stay. After completion of his 6-week antibiotic regimen the patient was referred electively for surgery, since he remained minimally symptomatic. The mitral valve was replaced by a 33 mm Carpentier Edwards pericardial valve.

Discussion

Infective endocarditis continues to have a high mortality. The one-year mortality is about 30% in various series, although strict adhesion to a standardized therapeutic protocol may confer lower mortality rates, as may the implementation of newer guidelines. Echocardiography has a fundamental role in the diagnosis of infective endocarditis, in complication recognition, and in surgical decision making. TTE has 40-63% sensitivity in the detection of valvular vegetations, while TEE has a superior sensitivity of 90-100%. Moreover, TEE is particularly useful in assessing complications such as abscesses, fistulas, perforated leaflets, pseudoaneurysms, or dehiscence.
of a prosthetic heart valve, and is needed for this rea-
son even when TTE has already identified the pre-
ence of vegetations. Real-time 3D TEE allows for the
optimal identification of the mitral valve apparatus
morphology and pathology. In infective endocardi-
tis it clearly visualizes the leaflet geometry and anato-
my. Additionally, it has shown superior identification
of aortic valve complications. These features of real-
time 3D TEE offer incremental value in revealing the
cardiac complications of infective endocarditis, thus
guiding patient’s risk stratification, medical and surgi-
cal management.

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