

Serial Transesophageal Echocardiography Imaging of a Postoperative Aortic Ring Abscess : A Case Report

Toru SUZUKI
Eiji OHTAKI
Masao KITAOKA
Katsumi SAITO
Kazuhiro OSADA
Koichi KITAHARA
Shin SUZUKI
Mitsuhiko KAWASE*

Abstract

Transesophageal echocardiography (TEE) was used for the serial observation of a postoperative perivalvular abscess of a prosthetic aortic valve in a 65-year-old man who underwent aortic valve replacement for aortic regurgitation. Five months later, TEE revealed an aortic ring abscess. Ascending aortic grafting (Bentall method) and translocation of the aortic prosthetic valve were conducted for progressive mechanical valve dysfunction. Postoperative TEE showed flow between the left ventricular outflow tract and the abscess, which was unrestricted 1 month later. Associated clinical improvement suggested that washout of the abscess was a critical factor. This case illustrates the usefulness of TEE for examining postoperative aortic ring abscess.

Key Words

echocardiography (transesophageal), aortic disease (ring abscess), endocarditis (infective)

INTRODUCTION

Perivalvular abscess is associated with both high morbidity and mortality. Early detection and diagnosis are critical. Echocardiography is important in the detection of vegetations in infective endocarditis and also in the diagnosis of perivalvular abscess. We report the use of transesophageal echocardiography (TEE) in the serial observation of a postoperative perivalvular abscess of a prosthetic aortic valve.

CASE REPORT

A 65-year-old Japanese man was referred to our institution for evaluation of aortic regurgitation. At initial presentation, a grade III diastolic murmur

was audible at the mid-left sternal border. A chest radiograph showed an enlarged heart with a cardiothoracic ratio (CTR) of 63%. Transthoracic echocardiography (TTE) revealed severe aortic regurgitation due to prolapse of the right coronary cusp and an enlarged left ventricle (end-diastolic dimension of 60 mm) with reduced ejection fraction of 47%. No vegetation was found. Cardiac catheterization confirmed the echocardiographic findings. Subsequent aortic valve replacement was performed using a St. Jude type (SJM) prosthesis. Intra-operative findings indicated infective endocarditis with inflammation of the commissure between the left and right coronary cusps. Tissue culture was negative. There was neither aneurysm formation nor extension of vegetations and valvular

榊原記念病院 循環器内科, *心臓外科 : 〒151 東京都渋谷区代々木 2-5-4

Divisions of Cardiology and *Cardiovascular Surgery, Sakakibara Heart Institute, Tokyo.

Address for reprints : OHTAKI E, MD, The Division of Cardiology, Sakakibara Heart Institute, Yoyogi 2-5-4, Shibuya-ku, Tokyo 151

Manuscript received March 2, 1995; revised April 13, 1995; accepted May 1, 1995

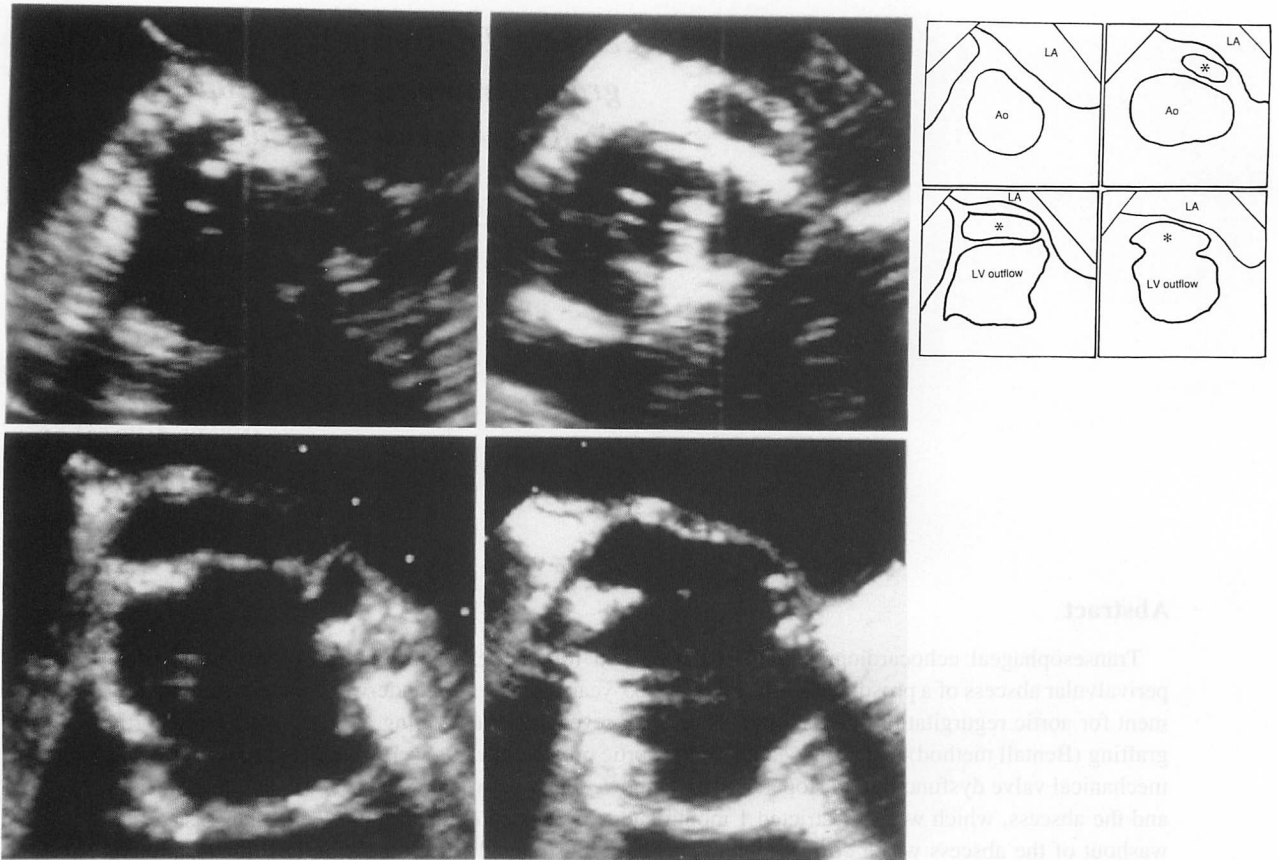


Fig. 1 Serial transesophageal echocardiograms (TEE) of the aortic ring abscess

Upper left : One month after aortic valve replacement with a St. Jude type prosthesis (ALOKA SSD 870 biplane TEE).

Upper right : Five months later showing an echo lucent cavity suggestive of aortic ring abscess located posterior wall of the aortic root (ALOKA SSD 870 biplane TEE).

Lower left : One month after modified Bentall procedure (grafting, valve distal translocation, abscess closure) showing remnant echo lucent cavity (Hewlett Packard Sonos 1500 multiplane TEE).

Lower right : One month later showing the septum separating the echo lucent cavity from the left ventricular outflow tract has almost completely disappeared (Hewlett Packard Sonos 1500 singleplane TEE).

See illustrations for orientation.

LA = left atrium; LV = left ventricular outflow tract; Ao = aorta; * = echo lucent cavity.

destruction into the aortic annulus. The postoperative course was uneventful. TEE performed 1 month after surgery revealed no perivalvular abscess of the aortic valve (**Fig. 1-upper left**). Five months later, a diastolic murmur suggestive of aortic regurgitation became evident associated with a low-grade fever. TEE revealed an echo lucent cavity suggestive of perivalvular abscess on the posterior side of the prosthetic aortic valve (**Fig. 1-upper right**), which could not be confirmed by TTE. Congestive heart failure due to malfunction of the prosthetic valve progressed.

The patient was hospitalized for re-operation of the aortic valve. TTE revealed severe paravalvular aortic regurgitation, and the end-diastolic left ventricular dimension was increased to 57 mm with a reduced ejection fraction of 47%. Systemic inflam-

matory signs were not found prior to operation. Intra-operative findings showed dehiscence of the SJM prosthesis spanning approximately 1.5 cm from the right to non-coronary cusps. An abscess foramen (2.5 cm × 1.0 cm) was found adjacent to the left coronary cusp. The tissue culture was negative. A modified Bentall procedure was conducted using a composite graft comprised of an SJM 21 mm prosthesis sutured to a 24 mm graft replacing the native aortic root. Debridement and closure of the perivalvular abscess were also conducted. Antibiotics were administered following surgery, but the low-grade fever and inflammatory findings persisted for 1 month. TEE revealed an echo lucent cavity at the same site as prior to the operation and flow between the left ventricular outflow tract and the echo lucent cavity (**Fig. 1-lower left**). Sub-

sequent spontaneous clinical resolution occurred. TEE disclosed disappearance of the septum separating the left ventricular outflow tract and echo lucent cavity, and unrestricted flow between the two chambers (Fig. 1—lower right). The subsequent course was uneventful.

DISCUSSION

Echocardiography is essential for the diagnosis of infective endocarditis because this non-invasive method can detect vegetations¹⁾ as well as perivalvular abscess. Previous studies have demonstrated the superior sensitivity of TEE and the limitations of TTE for detecting perivalvular abscess²⁻⁴⁾. In our case, final diagnosis based on TTE was difficult as the cavity was located behind the prosthetic aortic valve. Serial TEE disclosed the echo lucent

cavity prior to the second valve replacement procedure and the clear disappearance of the septum separating the echo lucent cavity and left ventricular outflow tract after the procedure. Clinical improvement coincided with the disappearance of the septum, suggesting that spontaneous drainage of the abscess following disappearance of the septum promoted eventual antibiotic cure of postoperative inflammation.

Previous reports have documented echocardiographic diagnosis of spontaneous drainage of paravalvular abscess⁵⁾ and fistula formation⁶⁾. Complications of composite aortic graft reconstruction have also been reported^{7,8)}. The present case illustrates the usefulness of serial TEE in the postoperative examination of patients with perivalvular abscess of a prosthetic aortic valve.

要 約

経食道心エコー図により経過を追跡した大動脈弁置換術後弁輪膿瘍の1例

鈴木 亨 大滝 英二 北岡 正雄 齊藤 克己
長田 和裕 北原 公一 鈴木 紳 川瀬 光彦

大動脈弁輪人工弁置換後に発症した弁輪膿瘍の術後経過の観察に、経食道心エコー図(TEE)が有用であった1例を呈示した。症例は65歳、男。大動脈弁閉鎖不全に対し、大動脈弁置換術を施行。術後5ヵ月のTEEで弁輪膿瘍の所見を認めた。人工弁機能不全による心不全が進行したため、Bentall法による上行大動脈の置換とtranslocationによる再弁置換術を施行。再弁置換1ヵ月後のTEEで残存弁輪膿瘍と新たな左室流出路との間に交通路を示す血流が検出された。さらに1ヵ月後のTEEでは、弁輪膿瘍と左室流出路の間の隔壁はほぼ完全に消失していた。ほぼ同時に発熱などの臨床経過の改善がみられたことから、本例では弁輪膿瘍の洗い出しが臨床的な改善にとって重要なファクターと考えられた。本例では、経胸壁心エコー図法では確診できなかった弁輪膿瘍の興味深い術後経過を観察するうえで、TEEが有用であった。

J Cardiol 1995; 26: 107-110

References

- 1) Wann LS, Dillon JC, Weyman AE, Feigenbaum H: Echocardiography in bacterial endocarditis. *N Engl J Med* 1976; **295**: 135-139
- 2) Ellis SG, Goldstein J, Popp RL: Detection of endocarditis-associated perivalvular abscesses by two-dimensional echocardiography. *J Am Coll Cardiol* 1985; **5**: 647-653
- 3) Daniel WG, Mugge A, Martin RP, Lindert O, Hausmann D, Nonnast-Daniel B, Laas J, Lichtlen PR: Improvement in the diagnosis of abscesses associated with endocarditis by transesophageal echocardiography. *N Engl J Med* 1991; **324**: 795-800
- 4) Aguado JM, Gonzales-Vilchez F, Martin-Duran R, Arjona R, Vazquez de Prada JA: Perivalvular abscesses associated with endocarditis: Clinical features and diagnostic accuracy of two-dimensional echocardiography. *Chest* 1993; **104**: 88-93
- 5) Giannoccaro P, Ascah KJ, Sochowski RA, Chan KL, Ruddy TD: Spontaneous drainage of paravalvular abscess diagnosed by transesophageal echocardiography. *J Am Soc Echocardiogr* 1991; **4**: 397-400
- 6) Sheppard RC, Chandrasekaran K, Ross J, Mintz GS: An acquired interatrial fistula secondary to para-aortic abscess documented by transesophageal echocardiography. *J Am Soc Echocardiogr* 1991; **4**: 271-276
- 7) Barbetseas J, Crawford ES, Safi HJ, Coselli JS, Quinones MA, Zoghbi WA: Doppler echocardiographic evaluation of pseudoaneurysms complicating composite grafts of the ascending aorta. *Circulation* 1992; **85**: 212-222

8) San Roman JA, Vilacosta I, Castillo JA, Rollan MJ, Sanchez-Harguindey L : Role of transesophageal echocardiography in the

assessment of patients with composite aortic grafts for therapy in acute aortic dissection. *Am J Cardiol* 1994; **73** : 519–521