

Predicting Risk of Embolization During Anticoagulation for Left Atrial Thrombus by Transesophageal Echocardiography : A Case Report

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Abstract

A 75-year-old woman was admitted with transient left hemiparesis accompanied by diminished level of consciousness in September 1994. Holter electrocardiography showed transient atrial fibrillation, and transesophageal echocardiography (TEE) revealed an atrial septal aneurysm, spontaneous echo contrast, and a thrombus in the left atrial appendage. The patient received anticoagulant treatment with warfarin, and follow-up TEE showed thrombus resolution. However, after the warfarin was discontinued, symptoms recurred in October 1995 and TEE showed a club-like left atrial thrombus (21 × 40 mm) originating in the left atrial appendage and extending to the center of the left atrium. Follow-up TEE after warfarin therapy showed resolution at the neck of the thrombus but the head threatened detachment. The thrombus was subsequently excised surgically. Follow-up TEE was critical for detecting the risk of significant embolization during anticoagulant therapy.

Key Words

Echocardiography (transesophageal), Anticoagulants (warfarin), Thromboembolism (cardiogenic embolism)

INTRODUCTION

Transthoracic echocardiography (TTE) is insensitive for detecting thrombus in the left atrium, especially in the left atrial appendage¹⁻³. In contrast, transesophageal echocardiography (TEE) provides excellent visualization of the left atrium and appendage^{4,5}, and appears to be the technique of choice for detecting atrial thrombi. We present a case of cardiogenic cerebral embolism from a club-like left atrial thrombus which developed after dis-

continuing warfarin. The thrombus was surgically excised. Follow-up TEE was useful for predicting the risk of re-embolization in this patient.

CASE PRESENTATION

A 75-year-old woman had been well until 2 days before admission, when transient left hemiparesis accompanied by diminished level of consciousness developed. She was admitted to our hospital in September 1994. On physical examination, she had clear consciousness and appeared well.

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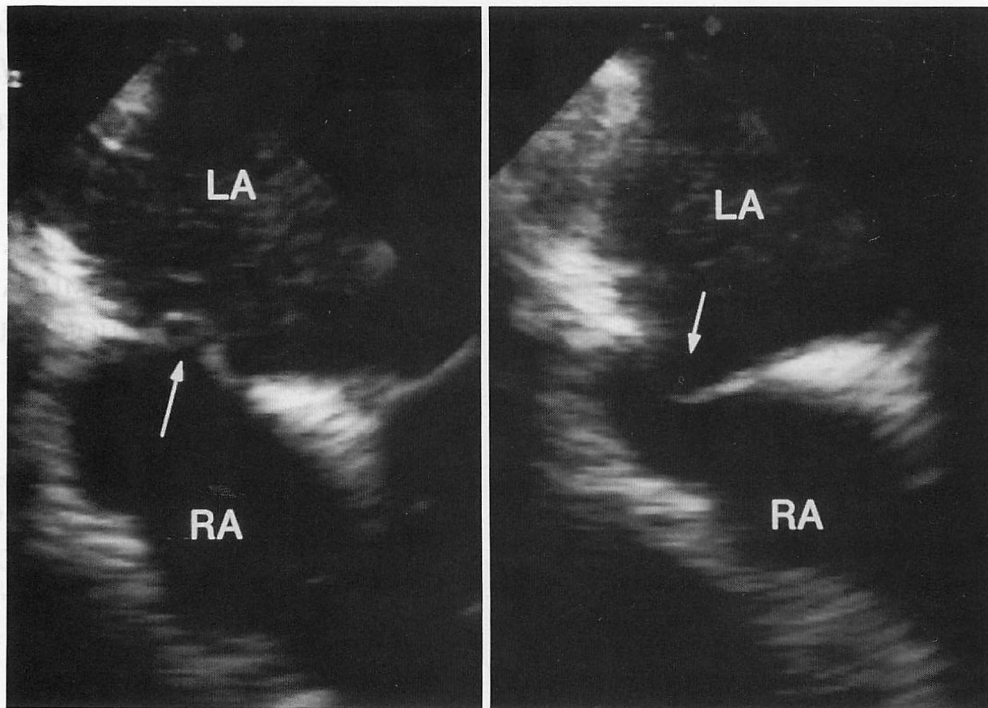


Fig. 1 Transesophageal echocardiograms (TEE) showing a redundant atrial septal aneurysm bulging into the left atrium (LA) by 6.3 mm (left) and into the right atrium (RA) by 7.2 mm (right). Spontaneous echo contrast ("swirling") in the left atrium is also seen.

Selected abbreviations and acronyms

ECG=electrocardiography
 FDP=fibrin degeneration products
 TEE=transesophageal echocardiography
 TTE=transthoracic echocardiography

Coagulation tests on admission revealed; platelet count $112,000/\text{mm}^3$, prothrombin time 125%, partial thromboplastin time 119%, fibrinogen 244 mg/dl, total fibrin degeneration products (FDP) $11 \mu\text{g}/\text{ml}$ (normal <5); FDP D-dimer $7.8 \mu\text{g}/\text{ml}$ (normal <0.8).

Twelve-lead electrocardiography (ECG) was normal. Holter ECG showed transient atrial fibrillation.

TTE showed mild left atrial dilatation, and normal left ventricular function and Doppler studies showed evidence of trace aortic insufficiency. TEE revealed a redundant atrial septum with an excursion of more than 6 mm (Fig. 1). The diagnosis was an atrial septal aneurysm⁶. TEE also revealed spontaneous echo contrast in the left atrium (Fig. 1-left) and a thrombus confined to the appendage (Fig. 2-

A).

She received anticoagulant therapy with warfarin, and the thrombus became smaller and eventually disappeared without clinical evidence of embolism (Figs. 2-B, C). After discharge, the patient did not return to our hospital from July 1995 and stopped taking warfarin.

She was readmitted to our hospital in October 1995, because her consciousness was again transiently diminished. Coagulation tests revealed increased plasma total FDP ($12 \mu\text{g}/\text{ml}$) and FDP D-dimer ($8.3 \mu\text{g}/\text{ml}$). ECG and Holter ECG showed sustained atrial fibrillation. TTE demonstrated a left atrial thrombus, but failed to define its contour. TEE revealed a club-like thrombus, 21 by 40 mm, which originated in the appendage and extended to the center of the left atrium (Fig. 3-A).

After 2 weeks of warfarin therapy, a deep hollow emerged in the neck of the thrombus (Fig. 3-B), and the head of the thrombus threatened detachment. The patient subsequently underwent surgical excision of the thrombus. At surgery, the club-like thrombus was connected to the left atrial appendage by a cord-like thrombus. The thrombus was too large to be removed intact and was removed piece-

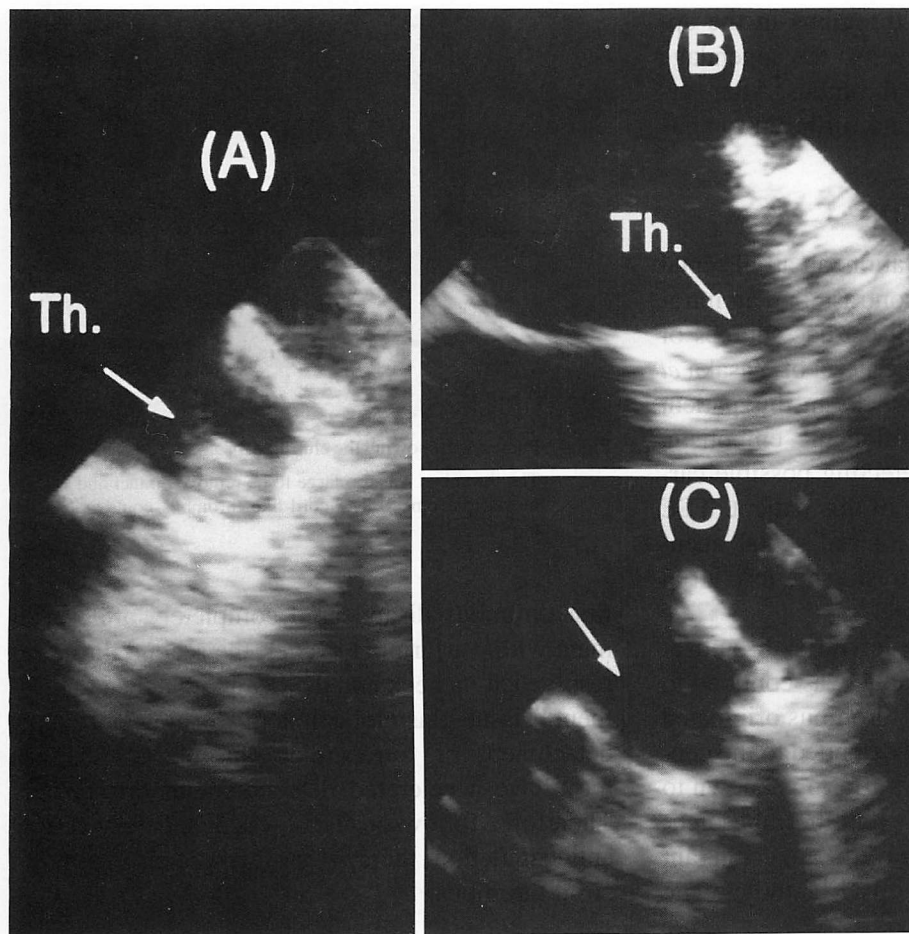


Fig. 2 TEE showing the first thrombus

The thrombus (Th) was confined to the left atrial appendage (A). After 2 weeks of warfarin therapy, the thrombus became smaller (B). After 2 months, it finally disappeared (C).

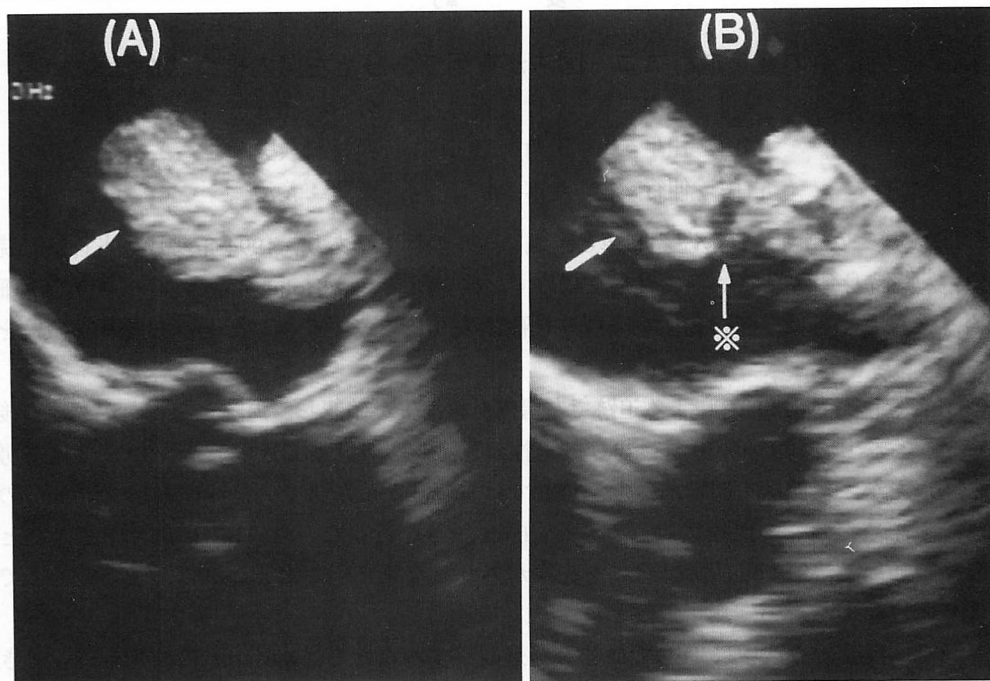


Fig. 3 TEE showing the second thrombus developed after discontinuance of warfarin

The thrombus had a club-like appearance, originated from the appendage and extended to the center of the left atrium (A). After 2 weeks of warfarin administration, a deep hollow emerged at the neck of the thrombus (shown by *; B).

meal (Fig. 4). The cord-like thrombus in the appendage was difficult to remove, so the appendage was plicated with the cord-like thrombus. After surgery, follow-up TEE revealed no further thrombus formation.

DISCUSSION

This patient had atrial fibrillation, an atrial septal aneurysm, spontaneous echo contrast, and an intracardiac thrombus which are all cardiac sources of embolism⁶⁻⁹. According to the criteria of Yasaka *et al.*¹⁰, the transient ischemic attacks in this patient were probably caused by cardiogenic embolism. TEE is highly sensitive for detecting possible cardiac sources of embolism^{4-6,9}. In this patient, TEE was superior for detecting the atrial septal aneurysm, spontaneous echo contrast, and left atrial thrombi.

This patient had two separate left atrial thrombi at different times. The first thrombus was confined to the appendage, and the second thrombus originated in the left atrial appendage and extended to the center of the left atrium. Because warfarin is known to aid thrombus resolution and prevent thrombus generation^{11,12}, the patient received anticoagulant therapy and underwent follow-up TEE studies. The



Fig. 4 Photograph showing the club-like thrombus resected surgically. The thrombus was too large to be removed intact and was removed piecemeal. The cord-like thrombus could not be removed.

first thrombus disappeared completely after treatment with warfarin. However, the second thrombus resolved at its neck and the head threatened detachment. Tissue plasminogen activator may accelerate detachment of intracardiac thrombi¹³. Warfarin may have accelerated detachment in this patient. Therefore, follow-up TEE was mandatory during anticoagulation therapy in this patient with left atrial thrombus.

要 約

抗凝固療法中の経食道心エコー図法が有用であった左房内棍棒状血栓の1例

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症例は75歳、女。一過性の左片麻痺と意識レベルの低下があり、1994年9月、当科に入院となった。入院時身体所見では特に異常を認めず、検査所見ではHolter心電図で一過性心房細動を認め、経食道心エコー図(TEE)では心房中隔瘤、左房内もやもやエコー図、左心耳内血栓を認めた。

Warfarin投与を行い、TEEによる追跡で左房内血栓消失を確認し、退院となったが、その後、外来に来なくなり、1995年10月、再び一過性の意識レベル低下で入院した。TTEでは左房内血栓を認めたが、形態は不明であった。TEEでは左心耳から左房中央に伸びる21×40mmの棍棒状血栓を認めた。この血栓に対してもwarfarin投与を行いながらTEEにより追跡したところ、血栓の頸部の溶解が著明で、今にも先端が外れて塞栓を起こすところであった。そこで手術により血栓除去を行い、無事退院となった。

本症例では抗凝固療法中にTEEで血栓を経過観察することで、warfarinの効果を確認できただけでなく、本剤投与による塞栓の合併症を未然に防ぐことができた。

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