

## Papillary Muscle Rupture Complicating a Papillary Muscle Abscess

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### ABSTRACT

Spontaneous rupture of a papillary muscle from a papillary abscess is extremely rare. Most cases of papillary muscle ruptures are due to myocardial infarction or trauma. We describe the clinical course of a 68-year-old man who died from a papillary muscle rupture as a complication of a papillary muscle abscess due to *Streptococcus pyogenes* septicemia. (Korean Circulation J 2006;36:242-244)

**KEY WORDS :** Mitral valve insufficiency ; Papillary muscles ; *Streptococcus pyogenes*.

### Introduction

Myocardial abscesses have been reported in 0.2% to 1.5% of autopsies. Most cases have occurred as a complication of generalized sepsis or endocarditis. In rare cases, rupture of a papillary muscle may develop as a complication of a myocardial abscess.<sup>1)</sup> This complication has been diagnosed by transthoracic and transeosophageal echocardiography.<sup>2)</sup> We report a case of a patient in whom a papillary muscle rupture was caused by a papillary muscle abscess.

### Case

A 68-year-old man was referred to our hospital because of an unremitting fever and vomiting. One week prior to his admission, he was hospitalized at another hospital because of fever, nausea, and malaise. Thereafter, his general condition acutely declined. He had been diagnosed as having non-insulin dependent diabetes mellitus and angina 10 years before this time. On admission, his blood pressure was 100/60 mmHg, his body temperature was 38.9°C, and his pulse rate was 110 beats/min. A physical examination revealed a 2/6 systolic murmur at the apex.

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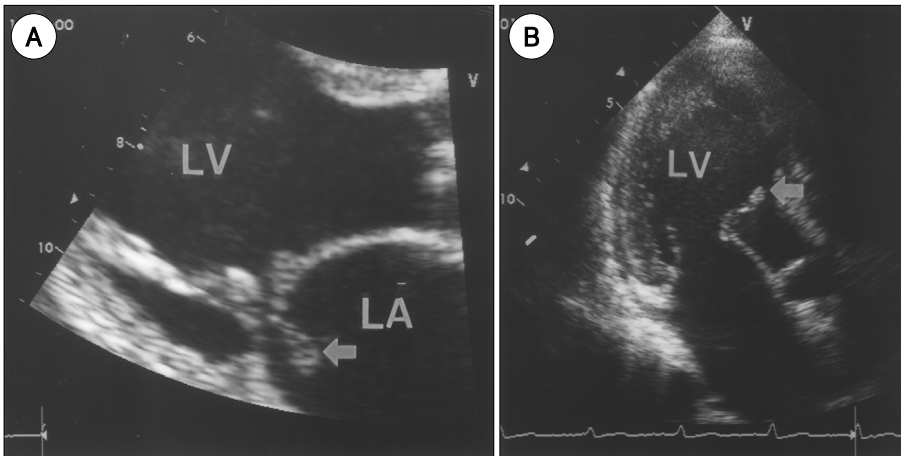
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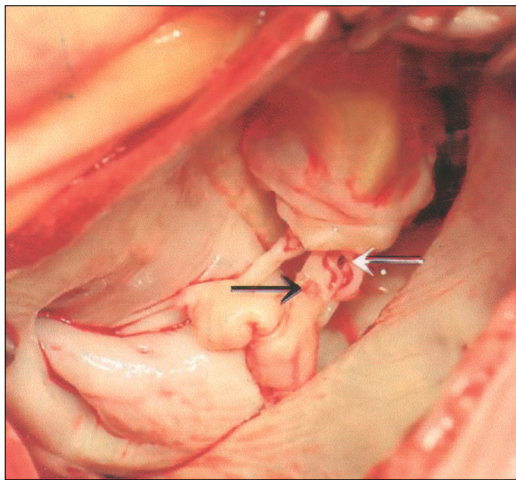
The results of the complete blood count revealed normocytic, normochromic anemia and leukocytosis (17,000/ $\mu$ L). An elevated erythrocyte sedimentation rate (36 mm/hr) and C-reactive protein level (195.5 mg/L) were demonstrated. He had azotemia with a serum creatinine level of 2.4 mg/dL and a blood urea nitrogen level of 52 mg/dL. The patient's creatinine kinase (CK) level was 49 U/L and his troponin T level was 0.053 ng/mL. Both values were normal (CK: 32-187 U/L, troponin T: 0-0.1 ng/mL). Chest radiography revealed mild cardiomegaly and sinus tachycardia was detected by electrocardiogram. Blood cultures were positive for *Streptococcus pyogenes*. The patient was treated with antibiotics (ampicillin and sulbactam) for 3 days. However, the patient's status did not stabilize. Therefore, transthoracic echocardiography was performed. A transthoracic echocardiogram identified severe mitral regurgitation and a fluttering round hyperechoic mass on the anterior mitral leaflet (Fig. 1A, B). The patient underwent an emergency mitral valve replacement through a median sternotomy under extracorporeal circulation. Intraoperatively, a rupture of the anterolateral papillary muscle caused by a papillary muscle abscess was demonstrated (Fig. 2). A microscopic section of the ruptured papillary muscle revealed the formation of a focal abscess with neutrophil infiltration (Fig. 3). The patient expired due to multiple organ failure 13 days after the cardiac operation.

### Discussion

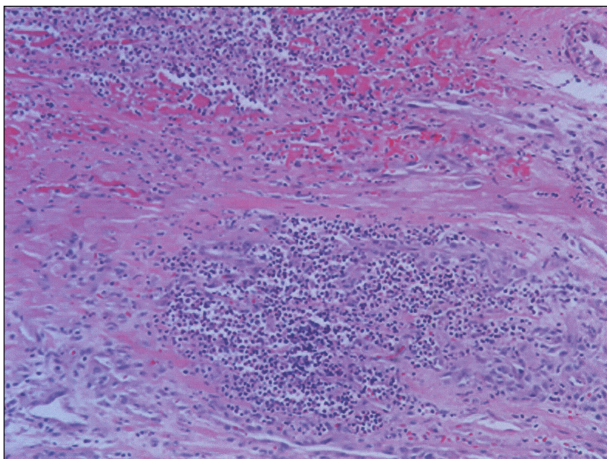
The most common cause of papillary muscle ruptures



**Fig. 1.** Transthoracic echocardiography in the parasternal long axis (A) and apical views (B) showing the ruptured head of the antero-lateral papillary muscle (arrow) and attached cord. LA: left atrium, LV: left ventricle.



**Fig. 2.** Intraoperative photograph showing the ruptured antero-lateral papillary muscle (black arrow) and papillary abscess cavity (white arrow).



**Fig. 3.** A microscopic section of the ruptured papillary muscle showing a focal abscess formation with neutrophil infiltration (hematoxylin and eosin (×200)).

is an occlusion of a coronary artery with a myocardial infarction affecting the base of the papillary muscle.<sup>3-5)</sup> An ischemic rupture of the papillary muscle could be ruled out in our patient, who was suffering from ste-

nosis of the coronary arteries. Ischemic rupture could not be the cause of illness for the following reasons: no electrocardiographic abnormalities were present, the cardiac enzymes were normal, the segmental left ventricular motion was normal on echocardiography, no myocardial infarction was detected by surgical inspection, and the focal abscess formation of the ruptured papillary muscle was revealed by histological examination. Thus, we concluded that the cause of the papillary muscle rupture was due to complications from a papillary muscle abscess.

Myocardial abscesses are usually small and multiple, but may occasionally be large and solitary. The most common organisms involved are *Staphylococcus aureus*, *Streptococcus pneumoniae*, gram-negative bacteria (*Escherichia coli*, *Klebsiella*), *Streptococcus viridans*, and *Salmonella* sepsis.<sup>6-8)</sup> Anaerobic abscesses are rare and are usually associated with myocardial infarctions, which may be related to oxygen stress in the area. In this case, *Streptococcus pyogenes* septicemia resulted in formation of an abscess in the papillary muscle, with subsequent rupture of that muscle. To our knowledge, this is the first reported case of papillary muscle rupture due to a papillary muscle abscess caused by *Streptococcus pyogenes*.

Papillary muscle ruptures are associated with significantly increased morbidity and mortality. Therefore, early diagnosis is very important in providing appropriate treatment. Transthoracic, and more recently, transesophageal, echocardiography have been reported to be useful in making this diagnosis noninvasively.<sup>2,9)</sup> This case emphasized the fact that delays in diagnosis and in institution of appropriate antimicrobial therapy for papillary muscle abscess may result in life-threatening complications.

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