A 78-year-old man visited his local hospital with acute onset chest pain and syncope. The electrocardiographic findings indicated lateral wall myocardial infarction. There was no history of angina pectoris or myocardial infarction. The chest radiograph was unremarkable. The echocardiography showed hypokinetic areas in the lateral wall of the left ventricle. The serum troponin-T level was high, and acute lateral wall myocardial infarction was diagnosed. Thrombolysis was undertaken by intravenous administration of recombinant tissue-type plasminogen activator. The patient went into shock several hours after thrombolysis. He was then transferred to the coronary care unit at our university hospital. On arrival he was found to have tachycardia with a blood pressure of 50/30 mm Hg. Echocardiography revealed moderate pericardial effusion. Coronary angiography revealed no obstruction or stenosis of the coronary arteries. Inotropic support as well as intraaortic balloon pumping was started, which improved his hemodynamic indices. Three days later while he was being weaned from an intraaortic balloon pump, he suddenly went into shock with a systolic blood pressure of 50 mm Hg. Echocardiography revealed a marked increase in pericardial effusion. Then he was immediately taken to the operating room with suspected rupture of the left ventricular wall. The pericardium was promptly opened through a standard median sternotomy. A large amount of blood was removed, which immediately improved his hemodynamic indices. A large myocardial infarction in the lateral aspect from the base to the apex was seen with free-wall oozing type bleeding. Under dry conditions, a 40 × 25 mm piece of TachoComb was positioned on the area and was pressed to the surface of the working ventricle for 5 minutes (Fig 1). This was repeated three times after which no bleeding was observed. The chest was closed and drained in the usual manner. A cardiopulmonary bypass was not instituted during the procedure. The operating time was 53 minutes. The patient was transferred to the intensive care unit in

Left ventricular free-wall rupture is a well recognized complication of myocardial infarction and a frequent cause of death. The appropriate surgical management varies significantly depending on the condition of the tear and the presence of concomitant lesions. We present a case of oozing type postinfarction cardiac rupture that was treated successfully by a sutureless patch technique using a fibrin tissue-adhesive collagen fleece (TachoComb [Torii Pharmaceutical, Tokyo, Japan]). This represents a quick, effective, and safe option for dealing with oozing type myocardial rupture due to myocardial infarction.


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References


**Sutureless Repair With TachoComb Sheets for Oozing Type Postinfarction Cardiac Rupture**

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Left ventricular free-wall rupture is a well recognized complication of myocardial infarction and a frequent cause of death. The appropriate surgical management varies significantly depending on the condition of the tear and the presence of concomitant lesions. We present a case of oozing type postinfarction cardiac rupture that was treated successfully by a sutureless patch technique using a fibrin tissue-adhesive collagen fleece (TachoComb [Torii Pharmaceutical, Tokyo, Japan]). This represents a quick, effective, and safe option for dealing with oozing type myocardial rupture due to myocardial infarction.


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Fig 1. Operative findings. Three pieces of TachoComb (Torii Pharmaceutical, Tokyo, Japan) were positioned on the oozing area, and no bleeding was observed.
stable hemodynamic condition with inotropic support and an intraaortic balloon pump. His operative course was uneventful. He was extubated 5 hours after surgery. The intraaortic balloon pump and inotropic support were stopped on postoperative days 1 and 2, respectively. He was discharged on postoperative day 13. By the 15-month follow-up, he had already resumed his daily life without limitations. The follow-up echocardiography showed slight hypokinetic areas in the lateral wall of the left ventricle, but it did not show another complication, extent of damages, or absence of a false aneurysm (Fig 2).

Comment
Myocardial rupture reportedly complicates 4% to 24% of cases with acute myocardial infarction, accounting for 12% to 21% of deaths after acute myocardial infarction [1]. The characteristics of these cases with myocardial rupture included patients who were 60 years or older, were female, had preexisting hypertension, and had their first myocardial infarction [1, 2]. Myocardial rupture generally occurs 1 to 7 days after myocardial infarction. The most common site of the rupture is the anterior or lateral wall of the left ventricle, in a midventricular position along the axis from the base to the apex [2].

The objective of surgical treatment is to save the patient's life by relief of cardiac tamponade and closure of the ventricular defect. Various techniques for ventricular closure have been described to date, with the most appropriate technique generally depending on the state of the tear and presence of concomitant lesions. The conventional approach includes myocardiectomy of infarct followed by replacement using a prosthetic patch or direct closure under cardiopulmonary bypass as well as a direct mattress suture buttressed with Teflon felt with or without cardiopulmonary bypass [3, 4]. A sutureless technique may be feasible when bleeding is only oozing and the patient's condition does not require cardiopulmonary bypass support. With the advent of tissue-adhesive materials, several authors have reported on a completely sutureless technique in which a patch of pericardium, Dacron, or Teflon is glued to the myocardium infarct, achieving good control of hemorrhage by avoiding issues related to myocardial friability and distortion [5–7]. Another distinct advantage is the potential to perform the procedure without cardiopulmonary bypass.

Several biological or synthetic glues have been used in sutureless techniques, including fibrin glues, gelatin-based glues, and cyanoacrylate. We used TachoComb, which is a ready-to-use collagen fleece coated with fibrin glue that contains fibrinogen, thrombin, and aprotinin, on the oozing myocardial rupture, thereby achieving complete hemostasis. An in vitro study previously showed that TachoComb provided reliable sealing and high adhesive strength [8]. The clinical efficacy of TachoComb in hemostasis has been established in surgery (both general and trauma); several studies have shown its usefulness in splenic trauma and in the hepatobiliary system, as well as in thoracic surgery.

The possible problems associated with a sutureless patch technique using TachoComb include the risk of recurrent rupture, pseudoaneurysm formation, and mitral valve regurgitation due to ischemic cardiomyopathy, as described by authors who have used other sutureless techniques [6, 7]. These authors suggest that an intraaortic balloon pump reduces afterload and left ventricular stress, thereby possibly reducing the likelihood of these complications.

We believe that the sutureless patch technique using TachoComb may be a possible surgical option to deal with oozing type myocardial ruptures due to myocardial infarction.

References


Recurrent Embolism in the Course of Marantic Endocarditis
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Marantic or nonbacterial thrombotic endocarditis (NBTE) associated with systemic embolism is usually a complication of advanced or terminal malignancies. We report on the case of a 46-year-old woman in whom nonbacterial thrombotic endocarditis (NBTE)-related cerebral embolism was the first clinical sign of ovarian neoplasm, which was diagnosed after cardiac surgery. Marantic endocarditis should alert the physician to make every effort to diagnose the possible background of this clinical phenomenon. Early identification of NBTE, treatment of the underlying disease, and the associated coagulopathy could possibly prevent cardiac surgery.


Recurrent systemic embolism in the course of endocarditis often requires cardiac surgery. Differentiation of marantic endocarditis from infective endocarditis is of paramount importance in terms of therapeutic strategy. In NBTE, the therapeutic efforts should focus on the underlying disease and the associated coagulopathy, which could prevent cardiac surgery.

A 46-year-old woman was admitted to the stroke unit of our hospital for severe bilateral migraine headache, apathy, and decreased attentiveness. Six months before admission she had a single cerebral embolism event of an "undetermined cause," which she recovered from completely. Neurologic examination revealed left-sided neglect, and visual, auditory, and partially sensory deficiencies with apractic disturbances. Splinter hemorrhages in the patient's nail beds and Osler's nodes were observed on the upper extremities.

Laboratory studies revealed a hemoglobin value of 8.2 g/dL; a normal white blood count; a platelet count of 46 × 1,000/μL; a normal prothrombin; a normal partial thromboplastin time; a normal fibrinogen level; a normal antithrombin III; a normal factor XII; normal plasminogen; normal proteins C and S; a D-dimer of 1,515 μg/mL; a negative anticardiolipin antibody test; a negative prothrombin 20210; a negative factor V Leiden mutation; a negative liver function test; a lactate dehydrogenase of 427 U/L; normal albumin; normal β-globulins and γ-globulins; and elevated α1 and α2 globulins.

Multiple urine and blood cultures were negative. Cerebrospinal fluid showed no signs of infection. The chest roentgenogram and electrocardiogram were normal.

Computed tomography of the brain showed multiple strokes involving both cerebral cortices in different perfusion territories. Diffusion-weighted magnetic resonance imaging visualized restricted proton diffusions (supra- and infra-tentorial) in nearly all areas, indicating acute multiple cardiogenic embolism (Fig 1). Noninvasive magnetic resonance angiography showed a completely normal intracerebral vasculature. A transthoracic echocardiography revealed normal heart dimensions and function, mild aortic regurgitation, and no evidence of vegetations. At transeosophageal echocardiography, vegetations smaller than 5 mm in diameter could be visualized attached to the left coronary and noncoronary aortic cusps (Fig 2).

Computed tomography scanning of the abdomen and pelvis revealed multiple embolization to both kidneys and tumor-suspected pathologic findings in the area of the uterine cervix.

Due to the risk of hemorrhagic transformation of the large cerebral ischemic infarcts, especially with the presence of thrombocytopenia, we decided not to perform cardiac surgery, and medication with antibiotics and anticoagulation with heparin were administered. During the next 2 days the patient experienced further systemic embolization with left-sided hemiparesis, hemianopia, and a decreased level of consciousness. On computed tomography of the brain, cerebral edema with midline shift and ventricle narrowing were observed. Following the recommendations of the consulting neurologist and the neurosurgeon, the patient underwent open heart surgery with aortic valve replacement.

During surgery, the aortic valve cusps were found to be entirely normal, but were covered with pedunculated vegetations mainly on their free edges at the ventricular surface. In addition, similar vegetations were found attached to the inner wall of the ascending aorta. Histopathologic examination of the valve specimen revealed no signs of inflammatory reaction; the vegetations consisted mainly of fibrin core and platelet thrombi suggestive of marantic endocarditis.

The postoperative course was uneventful with the exception of thrombophlebitis, which developed in both legs despite anticoagulation. Five weeks later the gynecologic investigation revealed ovarian neoplasm of an advanced stage. Therefore, the patient underwent radical tumor surgery with hysterectomy and lymphadenectomy. Postoperatively, multiple cerebral and pulmonary emboli and in due course, recurrent pleural and pericardial effusions of carcinomatous origin occurred. The