

Acute Myocardial Infarction and Left Subclavian Artery Occlusion in Behçet's Disease:

A Case Report

ATIL A IYISOY, M.D.¹, HURKAN KURSAKLIOGLU, M.D.¹, SEDAT KOSE, M.D.¹, ZEKI YESILOVA, M.D.², CENGİZ OZTURK, M.D.¹, KENAN SAGLAM, M.D.², AND ERTAN DEMİRTAS, M.D.¹

Abstract

A 42-year-old woman with Behçet's disease and pericardial effusion for 14 years presented with acute myocardial infarction and received thrombolytic therapy. Coronary angiography showed total occlusion of the left anterior descending artery. Subsequently, the left internal mammary artery was grafted to the left anterior descending artery. Approximately one year after bypass surgery, digital subtraction angiography of the left subclavian artery, performed because of chest and left arm pain, showed total occlusion of the left subclavian artery. Retrograde flow from the left vertebral artery filled the distal portion of the left subclavian artery.

In conclusion, patients with Behçet's disease should be investigated closely for involvement of other arteries when one vessel's involvement has been detected. We also recommend that free arterial grafts be used for any coronary surgical intervention, because of the risk of occlusion associated with the vasculitis of Behçet's disease.

Key Words: Behçet's disease, myocardial infarction, vasculitis, subclavian artery occlusion.

Introduction

BEHÇET'S DISEASE is a recurring systemic vasculitis of unknown etiology which can affect all bodily systems. In 1937, Hulusi Behçet, a dermatologist, first described the disease as a triad of oral and genital ulceration and ocular lesions. Cardiac involvement, known as cardio-Behçet's disease (1), has also been reported, although it is very uncommon. In such cases, reported symptoms have included thrombus formation in both right atrium and right ventricle, tricuspid regurgitation, coronary aneurysm and acute myocardial infarction (MI) due to coronary artery involvement (2–4).

In this case report, Behçet's disease was diagnosed in a 28-year-old woman who developed recurrent pericardial effusion and later had an acute MI because of the occlusion of the left anterior descending artery (LAD). Subsequently,

after a long follow-up period, the origin of the left subclavian artery became occluded.

Case Report

A previously healthy, 28-year-old woman presented in 1988 with pain and burning sensation in both inguinal regions and with red swellings on her legs. A punch biopsy of the involved skin revealed erythema nodosum. These lesions also occurred on both the anterior and posterior sides of the left arm; they disappeared after steroid therapy. Multiple recurrent aphthous ulcerations were found on the buccal mucosa under the tongue and on the lips. These ulcerations were successfully treated with topical steroids in the form of a paste.

In 1996, the patient was hospitalized because of extensive lesions on her skin and general poor health. In addition, both eyes were involved, and visual acuity in her left eye had rapidly diminished to near-blindness. Physical examination revealed thrombosis in the left retinal artery. Methylprednisolone (1 mg/kg) was initiated, and photocoagulation was performed. Ocular findings disappeared within three months. Steroid therapy was discontinued

From the Departments of ¹Cardiology and ²Internal Medicine, Gülhane Military Medical Academy, Ankara, Turkey.

Address all correspondence to Atilla Iyisoy, M.D., Gülhane Military Medical Academy, Department of Cardiology, 06018 Etlik, Ankara, Turkey; e-mail: aiyisoy@hotmail.com

Accepted for publication December 2003.

and colchicine therapy (1 mg/day) was started. At this point, a pathergy test was performed, as follows: an injector needle was inserted deeply (up to 2–4 mm) three times at a 45° angle into the right forearm and three times at a 90° angle into the left arm of the patient; all insertion places were marked circumferentially with a pen. A positive test was indicated by the appearance of four papulopustular lesions after 72 hours. Behçet's disease was diagnosed, based on the recurrent oral aphthous ulcers, erythema nodosum, ocular findings and positive pathergy test.

One year later, the patient was readmitted with the complaint of progressive fatigue while on colchicine therapy. Physical examination revealed that her lesions were reactivated. The patient was referred for cardiac evaluation. ECG and chest X-ray were normal, whereas diastolic dysfunction of the left ventricle and minimal pericardial effusion were observed on echocardiographic examination. Laboratory test results were as follows: hematocrit value, 37% (normal 37–47%); white blood cell, 8,000/mm³ (normal 4,800–10,800); platelet count, 250,000/mm³ (normal 150,000–400,000); erythrocyte sedimentation rate, 17 mm/h (normal < 20); C-reactive protein 12 IU (normal < 6); rheumatoid factor, 5 IU (normal 0–15); antinuclear antibodies, negative; and histocompatibility antigen HLA-B5, positive.

In August 2000, she was admitted to our coronary care unit (CCU) after a 30-minute episode of pressure-like chest pain. Serial ECGs demonstrated ST segment elevation in leads V_{1–4} and reciprocal changes in leads II, III, and aVF; acute anteroseptal MI was diagnosed (Fig. 1). The creatine phosphokinase (CPK-MB) was 26 IU/L (normal < 24) on admission and increased to 148 IU/L after 8 hours. This increase confirmed the diagnosis of acute MI. Her blood pressure was 80/50 mm Hg and her heart rate was 85 bpm. Tissue-plasminogen activator (t-PA) was chosen for thrombolytic therapy because of severe hypotension. Ten minutes after t-PA administration, nonsustained ventricular tachycardia occurred. Amiodarone infusion was started because of lack of response to lidocaine, and the episodes of ventricular tachycardia stopped. When the patient developed severe hypotension (50/30 mm Hg), dopamine and dobutamine infusions were started. She responded well to inotropic therapy and stabilized after two hours. Her heart rate continued to be rapid (106–125 bpm) for two days. At that time, complete blood count, pro-

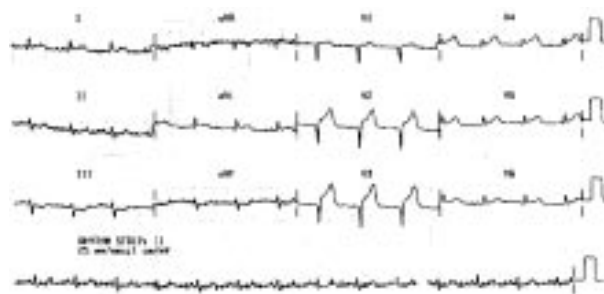


Fig. 1. Admission electrocardiogram presenting typical anteroseptal myocardial infarction.

thrombin time (1.32 INR), and activated partial thromboplastin time (39 seconds, normal 28–40) were within normal limits. Levels of plasma fibrinogen (218 mg/dL, normal 200–400), factor VIII and factor V were also normal. Platelet structure and function tests (platelet aggregation, adenosine diphosphate [ADP], collagen and epinephrine levels) were within normal limits. Plasma lipid values were as follows: triglyceride, 133 mg/dL; total cholesterol, 206 mg/dL; HDLchol, 42 mg/dL; LDLchol, 137 mg/dL. Fasting blood sugar was 87 mg/dL. Anticardiolipin antibodies immunoglobulin M (IgM) and IgG were negative. Plasma total homocysteine level was 10.70 mol/L (normal 7.83–9.54 for females). The patient was subsequently discharged.

In September 2000, coronary angiography showed total occlusion of LAD after the first diagonal artery. Other coronary vessels were normal. Left ventriculography demonstrated anterolateral and anteroapical hypokinesia. It was decided that a coronary bypass operation might help restore flow to the LAD. To exclude a pre-existing subclavian stenosis, a presurgical subclavian angiogram was performed; it showed normal vessel anatomy.

One week later, the patient's left internal mammary artery (LIMA) was grafted to her LAD. There was no gross pathologic appearance in the LIMA. The histologic findings in the LAD revealed inflammation consistent with chronic vasculitis; there was no specific evidence of atherosclerosis. No complication was observed in the immediate postoperative period.

In February 2001, the patient presented again with a 10-day history of shortness of breath, nausea and vomiting. Physical examination was normal. Chest X-ray showed an enlarged heart with prominent left ventricular shadow. ECG showed pathologic Q waves in leads V_{1–3} and T inversion in leads V_{2–6}.

Echocardiographic examination showed minimal mitral insufficiency, apical hypokinesia and pericardial effusion; the ejection fraction of the left ventricle was 54%. Administration of indomethacin, 200 mg daily, was begun for pericardial effusion. Because shortness of breath and chest pain persisted, coronary angiography was performed. Left internal mammary artery flow was observed to be normal by selective catheterization of left subclavian artery.

In October 2001, the patient was readmitted because of pain in both arms and in her chest, especially while exercising. On physical examination, left brachial artery and its lower pulses were nonpalpable. Aortography was performed for nonpalpable pulses and revealed total occlusion of the left subclavian artery. During digital subtraction angiography, injection of contrast material into the right subclavian artery resulted in visualization of the right subclavian artery, the right carotid arteries, and in the late phase, the left vertebral artery. Blood flow to the left subclavian artery came from the left vertebral artery (Fig. 2). The distal portions of the left subclavian and axillary arteries were normal. Also, it was noticed that the segment of right internal carotid artery distal to the posterior communicating artery was stenotic. A

saphenous vein graft was placed between the left and right subclavian arteries. On ultrasound examination one month later, flow was noted to be decreased in the left subclavian artery while normal in the right axillary artery. The patient's symptoms diminished. The patient is still being followed.

Discussion

Behçet's disease is a systemic multisystem vasculitis. It is estimated that the rate of vascular involvement in Behçet's disease varies from 7–29% (5). Vascular involvement is divided into three groups: venous and arterial occlusions and aneurysm formation (6). Large arterial lesions are infrequent in Behçet's disease. Large artery involvement occurs in 1.5–2.2% of all patients with Behçet's disease (7).

Acute MI is most often the result of atherosclerotic coronary artery disease. But in young adults with acute MI, nonatherosclerotic etiologies such as arteritis, trauma, embolization, dissection, spasm and congenital anomalies should initially be considered. Coronary artery involvement is very rare in Behçet's disease. To the best of our knowledge, only a few cases diagnosed in males were reported as MI in the lit-

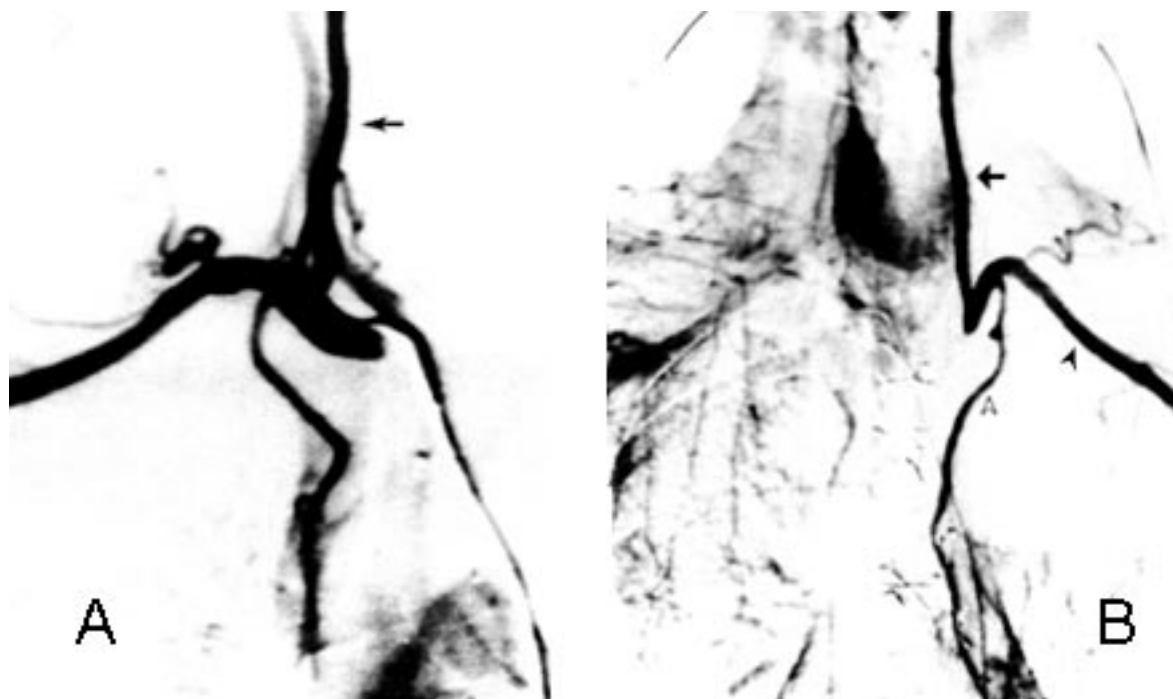


Fig. 2. (A) Digital subtraction angiography of right subclavian artery. Arrow shows right carotid artery. (B) Late phase angiogram shows retrograde flow into left vertebral artery (arrow); dark and open arrowheads reveal left subclavian artery and left internal mammary artery, respectively.

erature (4, 8, 9). This female case is the first report of combined lesions of the coronary artery presenting with acute anterior MI. Peripheral artery involvement included retinal artery thromboses (with blindness) and subclavian artery thrombosis.

Schiff et al. (4) reported a 31-year-old male diagnosed with Behçet's disease. This patient, with a family history of only coronary heart disease and without any history of diabetes mellitus, hypertension, hyperlipidemia or smoking, was first diagnosed with MI. His coronary angiography showed total occlusion of the LAD, as in our case. Following an episode of pericarditis, he experienced multiple cardioversions for ventricular tachycardia and fibrillation, and died due to ventricular tachycardia. Postmortem examination revealed marked fibrosis with aneurysmal dilatation of the apex and anterior half of the left ventricle. Examination of LAD demonstrated complete proximal occlusion by an organized thrombus, and distally a transmural sclerotic process, which partially destroyed the elastic layer and adventitia. It was suggested that such a transmural sclerotic process was consistent with arteritis due to Behçet's disease, because there was no finding suggestive of atherosclerosis.

A second case presenting with acute anteroseptal MI was a 34-year-old man with no known coronary risk factors. This was also considered a consequence of coronary arteritis instead of coronary atherosclerosis and embolism (8).

One of the other cases of coronary involvement, but not presenting as acute MI, was a 35-year-old Japanese housewife with Behçet's disease. She complained of pain in the epigastrium, right anterior chest and right shoulder. Her coronary angiogram demonstrated a vascular aneurysm of the proximal right coronary artery as well as two obstructive lesions (10). Bowles et al. (11) reported a 22-year-old woman who presented with acute MI, and had dilatation of the LAD and occlusion of the septal coronary artery. Siepmann and Kirch (9) recently reported a young man who had complete occlusion of the circumflex branch in the proximal part and a convoluted fistula from the left main branch to the pulmonary artery. Gullu et al. (12) described a silent myocardial ischemia in Behçet's disease that was probably due to microvascular vasculitis in the intramyocardial small arteries.

The common features of all venous and arterial histologic abnormalities include largely lymphocytic and plasma cell infiltration, dis-

rupted internal elastic lamina, aneurysms, occlusive thromboses and variously aged lesions (from fresh vasculitis to fibrotic replacement) of previously occluded vessels (13, 14).

Our patient had a history of smoking 10 cigarettes daily for several years. There was no family history of coronary artery disease and no other risk factors, such as hypercholesterolemia, hypertension, diabetes, or high plasma homocysteine level for atherosclerosis. We concluded that there were two etiologic reasons why acute MI in our patient was arteritis instead of atherosclerosis. First, there was no evidence of atherosclerosis in the biopsies of the LIMA and LAD obtained at operation. Second, the patient had no risk factors for coronary artery disease and there was no evidence of any atherosclerotic process. Subsequently, total occlusion of the subclavian artery occurred after an acute MI. Some authors think that elevated clotting factors such as platelet count, factor VIII, and fibrin split products appear to be the result and not the cause of the vasculitis (15). As with other idiopathic inflammatory diseases that affect endothelial cells, coagulation abnormalities in Behçet's disease, due to defective release of t-PA, are probably a secondary phenomenon (16). Our patient suffered from blindness, probably due to retinal artery thromboses. As previously reported, thrombotic occlusion may be a risk factor for acute MI.

Two points from the literature should be noted. First, coronary involvement is more common in men than in women (9), whereas the reverse is true for vascular involvement (17). Second, the coronary artery most often involved in Behçet's disease is the LAD.

This case has demonstrated that Behçet's disease should be investigated closely in terms of the heart and vessels, especially when symptoms develop which suggest impairment of flow. We propose that internal mammary artery or radial artery grafts should be used for coronary by-pass operation in the setting of Behçet's disease, because of the probability of occlusion of large arterial vessels such as the subclavian artery.

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