Coronary and vertebral subclavian steal demonstrated by subclavian angiography

Berat Acu1, Murat Firat1, and Orhan Onalan2*

1Department of Radiology, Gaziosmanpasa University Faculty of Medicine, Tokat, Turkey and 2Department of Cardiology, Gaziosmanpasa University Faculty of Medicine, Sivas Street, Tokat 60100, Turkey
* Corresponding author: Department of Cardiology, Sunnybrook Health Sciences Centre, 2075 Bayview Avenue, Suite E-241, Toronto, Ontario, Canada M4N 3M5. Tel: +1 416 480 6100/ext 7370, Fax: +1 416 480 4745, Email: oonalan@gmail.com

A 60-year-old woman who had previous coronary bypass surgery presented to the emergency room with progressive angina pectoris, left arm claudication, coldness, and intermittent dizziness. On physical examination, left arm pulses were weak and a systolic blood pressure difference of 100 mmHg between the left (50/0 mmHg) and right (150/90 mmHg) arms was noted. Coronary angiography showed totally occluded left anterior descending (LAD) and circumflex artery with normal right coronary artery. Saphenous vein graft to obtuse marginal artery was patent. Left subclavian angiography revealed a severe proximal stenosis (Panel A, asterisk). Coronary subclavian and vertebral subclavian steal were clearly seen during left subclavian angiography. Selective dilution of contrast dye at the LIMA-left subclavian junction indicated retrograde blood flow from LIMA (Panel A, long arrow). A similar finding was observed in the left vertebral artery, which indicates retrograde blood from vertebral to subclavian artery (Panel A, short arrows). Considering total occlusion of LAD artery in this case, we searched for a second bypass graft to LAD artery, which is responsible for coronary subclavian steal. We noted a sequential saphenous vein graft to diagonal and LAD artery, and there was a severe stenosis at its distal end (Panel B, long arrow). In addition, a brisk retrograde flow was noted in the LIMA anastomosed to the LAD artery ( Panels B and C, short arrows). A clear left subclavian angiography was obtained through contrast injection into the saphenous vein graft ( Panel C, long arrow). Vertebral subclavian steal was also confirmed with ultrasonography (Panels D and E). Note reversed blood flow in the left vertebral artery (Panels D and E, short arrows). Flow in the ipsilateral common carotid artery remains cephalad in direction (Panels D and E, long arrows).

Left subclavian artery stenosis was dilated and stented. Patient remained asymptomatic after procedure and at 1 year follow-up. Considering presence of dual graft to LAD (saphenous vein and LIMA) in our patient, it is likely that she had subclavian stenosis before coronary bypass surgery. The surgeons probably determined that another bypass graft to LAD artery was indicated when they noticed failure of blood flow in the LIMA during surgery. This case underlines the importance of a complete clinical evaluation in all patients undergoing coronary bypass surgery. Patients who have symptoms suggestive of vertebral or coronary subclavian steal syndrome and a significant blood pressure difference between left and right arms should have a subclavian angiography at the time of coronary angiography to exclude significant subclavian stenosis.

Published on behalf of the European Society of Cardiology. All rights reserved. © The Author 2009. For permissions please email: journals.permissions@oxfordjournals.org.