Non-ST Elevation Myocardial Infarction Triggered by Subclavian Steal Syndrome

Bulent Uzunlar, MD¹ Ahmet Karabulut, MD² Zeki Dogan, MD¹

¹ Department of Cardiology, Istanbul Medicine Hospital, Istanbul, Turkey

² Department of Cardiology, Acibadem Atakent Hospital, Istanbul, Turkey

Address for correspondence Ahmet Karabulut, MD, Department of Cardiology, Acibadem Atakent Hospital, Halkalı Merkez Mah, Turgut Özal Bulvarı No:16, Küçükçekmece, Istanbul, Turkey (e-mail: drkarabulut@yahoo.com).

Int J Angiol 2016;25:e37–e38.

Abstract

Keywords

- steal syndrome
- subclavian stenosis
- acute coronary syndrome

Coronary-subclavian artery (SCA) steal syndrome is an uncommon phenomenon in which coronary flow is diverted into the SCA through the patent left internal mammary artery (LIMA) conduit due to critical subclavian stenosis. The prevalence of significant left SCA (LSCA) stenosis in patients, referred for coronary bypass surgery, has been reported to be 0.2 to 6.8%. Most patients usually present with angina pectoris, and secondary myocardial infarction is rarely reported. Herein, we present a case of coronary bypass graft in which a left anterior descending artery-LIMA graft was applied to supply the left arm due to complete LSCA occlusion. The patient was hospitalized with a diagnosis of non-ST elevation myocardial infarction.

Most patients with subclavian steal syndrome usually present with angina pectoris, and secondary myocardial infarction is rarely reported.^{1,2} Herein, we present a case of coronary bypass graft in which a left anterior descending artery (LAD)-left internal mammary artery (LIMA) graft was applied to supply the left arm due to complete left subclavian artery (LSCA) occlusion. The patient was hospitalized with a diagnosis of unstable angina. The assessed cardiac markers were above the cutoff points.

A 75-year-old male patient presented with unstable angina. He had undergone three-vessel coronary bypass surgery 9 years ago. Cardiac markers were increased, including creatine kinase MB and troponin-I (51.5 U/L and 1.64 ng/mL, respectively). Coronary angiography revealed the patent venous grafts anastomosed to the right coronary and circumflex artery and also a patent LIMA graft anastomosed to the middle LAD. However, there was retrograde flow through the LIMA and the left arm was supplied by retrograde flow from the LAD (► Fig. 1B), since the LSCA was totally occluded from the osteal segment (► Fig. 1A). The patient did not show any claudication of the left arm nor symptoms related to posterior cerebral circulation. There was a systolic blood pressure discrepancy of 30 mm Hg between the upper extremities. The asymptomatic clinical picture may be explained by the sufficient retrograde flow to the left arm, which can trigger myocardial infarction in

the distal LAD territory. The EuroSCORE of the patient was calculated to be 14. We preferred interventional therapy initially. Graft stent implantation to the LAD and elective bypass surgery to the SCA was scheduled.

Coronary-SCA steal syndrome is an uncommon phenomenon in which the coronary flow is diverted into the SCA through the patent LIMA conduit due to critical subclavian stenosis.³ The prevalence of significant LSCA stenosis in patients referred for coronary bypass operation has been reported to be 0.2 to 6.8%. Most patients usually present with angina pectoris, and secondary myocardial infarction is rarely reported.^{1,2} Treatment strategies vary according to the clinical picture, includes a medical follow-up, and interventional approaches involving the SCA or LAD itself. Initially, a percutaneous intervention of either SCA or LAD can be preferred. Successful interventions to the SCA in similar clinical settings have also been reported.⁴ However, percutaneous intervention of chronic total occlusion of the SCA is still obscure. In our case, the SCA was totally occluded from the osteal segment and the occluded segment was relatively long. Therefore, we preferred the safer approach (i.e., percutaneous intervention of the LAD with graft stent deployment and subsequent surgical therapy for the SCA if necessary); however, the patient declined interventional treatment and followed up with medical therapy.

published online
July 16, 2014

Copyright © 2016 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA.
Tel: +1(212) 584-4662.

DOI <http://dx.doi.org/10.1055/s-0034-1382809>.
ISSN 1061-1711.

Fig. 1 Anteroposterior projection showing (B) LAD-LIMA graft and circulation of the left arm and (A) subclavian artery occlusion. LAD, left anterior descending artery; LIMA, left internal mammary artery.

In conclusion, subclavian steal syndrome may rarely cause acute coronary syndrome. A preoperative SCA evaluation may prevent the development of such a clinical picture. The patient can be treated with interventional therapy through either a SCA or coronary artery approach according to anatomical applicability.

Acknowledgments

The authors do not report any conflict of interest regarding this work. This work was not supported by any company.

References

- 1 Tan JW, Johan BA, Cheah FK, Wong P. Coronary subclavian steal syndrome: a rare cause of acute myocardial infarction. *Singapore Med J* 2007;48(1):e5–e8
- 2 Mandak J, Lojik M, Tuna M, Chek JL. Coronary subclavian steal syndrome causing acute myocardial infarction in a patient undergoing coronary-artery bypass grafting. *Case Rep Med* 2012; doi: 10.1155/2012/798356
- 3 Osiro S, Zurada A, Gielecki J, Shoja MM, Tubbs RS, Loukas M. A review of subclavian steal syndrome with clinical correlation. *Med Sci Monit* 2012;18(5):RA57–RA63
- 4 Spaček M, Veselka J. Claudication pain in the left arm of a coronary artery bypass graft patient using crutches: coronary subclavian steal syndrome - a case report. *Int J Angiol* 2010;19(1):e41–e42