Case Report

Bifurcating Radial Artery: a Useful Anatomic Variation for Coronary Artery Bypass Grafting

Mehrab Marzban, MD[1*], Seyed Hesameddin Abbasi, MD[1,2], Amirali Rahnemay Azar, MD[1]

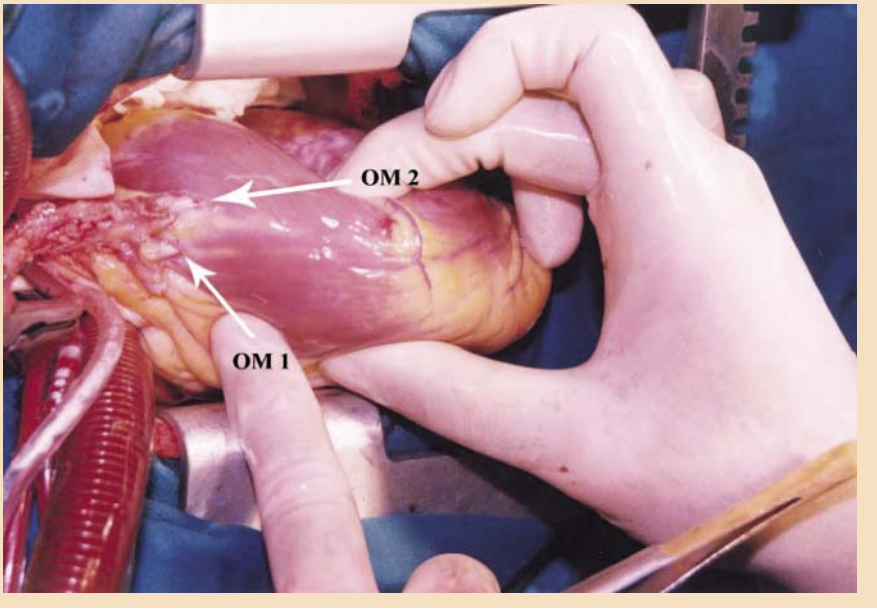
[1]*Tehran Heart Center, Tehran University of Medical Sciences, Tehran, Iran.*
[2]*National Iranian Oil Company Central Hospital, Tehran, Iran.*

Abstract

A 56-year-old man with a two year history of chronic stable angina underwent elective coronary artery bypass grafting (CABG) due to angiographic report of three vessel disease and tight stenosis at proximal part of left anterior descending artery (LAD). While harvesting of radial artery (RA), the distal half of radial artery was found to bifurcate to two parallel branches with equal size. We used this as a single conduit to bypass the first and second obtuse marginal (OM) branches. The patient had a smooth post-operative course and uneventful recovery.

The Journal of Tehran Heart Center 1 (2006) 53-54

Keywords: *Coronary artery bypass grafting • Bifurcating radial artery*



Corresponding Author:** ***Mehrab Marzban, *Department of Cardiac Surgery, Tehran University of Medical Sciences, Tehran Heart Center, North Karegar Street, Tehran, Iran 1411713138. Tel: +98 21 8802 92 56. Fax: +98 21 8802 92 56. E-mail: mehrabmarzban@yahoo.com*

Introduction

Compared with saphenous vein graft, use of the internal mammary artery (IMA) as conduit has resulted in superior long-term results.[1,2] On the basis of these findings, other arteries have been used in CABG and nowadays many cardiac surgeons favor total arterial revascularization,[3,4] and the radial artery is their preferred conduit along with the IMA.[5-8]

In this article we report the case of a patient with bifurcating radial artery, a rare anatomic variation, and its use as a single conduit for CABG.

Case Report

A 56 years old man with two years history of chronic stable angina which was aggravated recently, underwent coronary arteriography in our institute which was indicative of three vessel disease and left ventricular ejection fraction (LVEF) of 45%. He scheduled for elective CABG. In pre-operative assessment both radial and ulnar artery pulsation was good and Allen's test was negative. During the operation, we found that the radial artery bifurcated 7-8 cm proximal to styloid process of radius and the two branches ran parallel together and had equal size. We decided to use it as a single conduit and we anastomosed one end to the first branch of obtuse marginal and the second one to OM2, and its proximal end was anastomosed to the ascending aorta (figure 1). Also, LIMA was anastomosed to diagonal and LAD in sequential manner, and a vein graft was used to bypass the right coronary artery. Patient had smooth post-operative course and uneventful recovery. At 3-month follow up Patients was free of angina or hand complication. Theexercise test was negative and showed excellent functional capacity and echocardiography revealed LVEF of 50%.

Discussion

Since its re-introduction by Acar and Colleagues, the radial artery has Generated Considerable interest as an alternative conduit For CABG.[9] The RA graft is rapidly gaining popularity because of its diameter length, safety and ease of harvest as well as the encouraging early and mid-to-long term results.[5-8] Use of bilateral RA grafts has also been reported in many cases,[2] this artery is used as a composite graft, forming part of a Y-graft or T-grafts. In a previous report of bifurcating RA, one of its branches was sacrificed,[10] but we imagine this anatomical variation as a natural Y-graft that would excel over the composite Y-graft in terms of less thrombogenicity. Although pre-operative detection of such anomaly is difficult, but when encountering this, we can think of using it as a single conduit.

References

1. Loop FD, Lytle BW, Cosgrove DM, Stewart RW, Goormastic M, Williams GW, Golding LA, Gill CC, Taylor PC, Sheldon WC. Influence of the internal-Mammary-artery graft on 10-year survival and other cardiac events. N Engl J Med 1986;314:1-6.
2. Karthik S, Srinivasan AK, Grayson AD, Jackson M, Mediratta NK. Left internal mammary artery to the left anterior descending artery: effect on morbidity and mortality and reasons for nonusage. Ann Thorac Surg 2004;78:142-148.
3. Tatoulis J, Buxton BF, Fuller JA, Royse AG. Ann Thorac Surg 1999;68:2093- 2099.
4. Sundt TM 3rd, Barner HB, Camillo CJ, Gay WA Jr. Total arterial revascularization with an internal thoracic artery and radial artery T graft. Ann Thorac Surg 1999;68:399-404.
5. Sajja LR, Mannam G, Pantula NR, Sompalli S. Role of radial artery graft in coronary artery bypass grafting. Ann Thorac Surg 2005;79:2180-2188.
6. Tatoulis J, Buxton BF, Fuller JA. Patencies of 2127 arterial to coronary conduits over 15 years. Ann Thorac Surg 2004;77:93-101.
7. Acar C, Ramsheyi A, Pagny JY, Jebara V, Barrier P, Fabiani JN, Deloche A, Guermonprez JL, A. The radial artery for coronary artery bypasses grafting: clinical and angiographic results at five years. J Thorac Cardiovasc Surg 1998;116:981-989.
8. Possati G, Gaudino M, Alessandrini F, Luciani N, Glieca F, Trani C, Cellini C, Canosa C, Di Sciascio G. Midterm clinical and angiographic results of radial Artery grafts used for myocardial revascularization. J Thorac Cardiovasc Surg 1998;116:1015-1021.
9. Acar C, Jebara VA, Portoghese M, Beyssen B, Pagny JY, Grare P, Chachques JC, Fabiani JN, Deloche A, Guermonprez JL. Revival of the radial artery for coronary
artery bypasses grafting. Ann Thorac Surg 1992;54:652-659.
10. Chamberlain MH, Taggart DP. Images in cardiothoracic surgery: Bifurcating radial artery. Ann Thorac Surg 2001;72:1399.