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Case Report
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Large Intercostal Branch after Coronary Artery Bypass Grafting with the Internal Thoracic Artery: A Case Report

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Abstract

A 34-year-old man underwent two-vessel coronary artery bypass grafting of the left internal thoracic artery to the left anterior descending artery and the right gastroepiploic artery to the right coronary artery. Postoperative angiographic examination revealed a large anomalous intercostal artery from the grafted thoracic artery. The patient was successfully treated with endovascular coil embolization of the anomalous branch.

Keywords: Coronary artery bypass grafting; Internal thoracic artery; Anomalous intercostal artery; Endovascular surgery; Endovascular coiling

Introduction

The internal thoracic artery (ITA) has played a definitive role as a vascular conduit for coronary artery bypass grafting during the past few decades. The branches of the ITA include the superior phrenic, mediastinal, pericardial, and anterior intercostal arteries along with several others. Structural lesions of the subclavian artery and ITA branches can cause insufficient clinical outcomes. We herein present a case involving a patient with a large anterior intercostal branch of the ITA that required endovascular coiling to achieve sufficient graft flow after coronary artery bypass grafting with the ITA.

Case Presentation

A 34-year-old man was transferred to our hospital for coronary artery bypass grafting. The patient had a history of Kawasaki disease in a childhood. The right coronary artery was totally occluded, and the left anterior descending artery exhibited 99% stenosis. No coronary artery aneurysms were detected. The right gastroepiploic and left internal mammary arteries were anastomosed to the right coronary and left anterior descending arteries as pedicle grafts under cardiac arrest. His postoperative course was uneventful and he showed no ischemic symptoms. However, postoperative coronary angiography showed a large side branch of the grafted IMA (Figure 1a). Transcatheter embolization of the branch was scheduled because of a possible risk of coronary artery steal syndrome, and the embolization was successfully performed (Figure 1b). The patient was doing well without any ischemic symptoms or signs, even during exercise, 8 months after surgery.

Discussion

Coronary artery steal syndrome requires additional procedures after coronary artery bypass grafting with pedicle grafts such as the ITA. Stenotic lesions of the subclavian artery could account for this syndrome [1]. Anomalous lateral branches of the graft might also disturb blood flow to the coronary artery [2-4]. The main anatomical branches of the ITA include the anterior costal arteries, but the ITA rarely has anomalous branches [5].

Endovascular or open repair is employed for the treatment of these anomalous branches after coronary artery bypass grafting using the ITA. Endovascular repair is currently the first-choice treatment [2,3,6]. Open repair has also shown effective results. Pagni et al. [7] reported a case in which the patient underwent ligation of a large anomalous branch of the ITA by video-assisted thoracic surgery.

Our patient had a history of Kawasaki disease, which can result in coronary and other peripheral artery aneurysms and stenotic lesions [8-10]. We found no reports of collateral artery development without stenotic or aneurysmal lesions after Kawasaki disease in a PubMed search. Therefore, we infer that the large branch in our case was an anomalous one but was not secondary to Kawasaki

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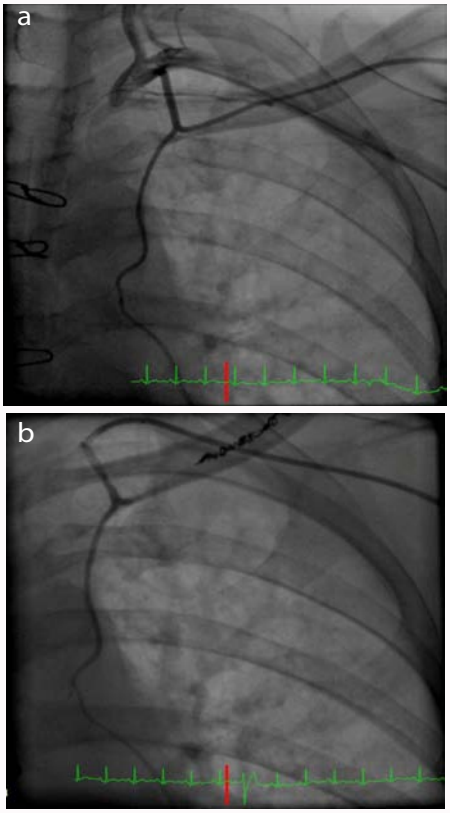

Figure 1: Postoperative arteriogram of the left internal mammary artery. **a**: The grafted left internal mammary artery branches a large intercostal artery. **b**: The anomalous branch is obliterated by coiling.

disease. During the operation, the large branch might mislead us into taking it as the subclavian artery.

Coronary artery bypass grafting with ITA grafts can offer good clinical outcomes, but the potential risk of coronary steal syndrome should be considered in patients with anomalous branches. A complete harvest of ITA grafts is mandatory to prevent this complication.

Conclusion

Postoperative coronary angiography showed a large side branch of the grafted ITA after coronary artery bypass grafting in a 34-year-old man with a history of Kawasaki disease. The anomalous branch was successfully treated with endovascular coiling.

References

1. Cardon A, Leclercq C, Brenugat S, Jego P, Kerdiles Y. Coronary subclavian steal syndrome after left internal mammary bypass in a patient with Takayasu's disease. J Cariovasc Surg. 2002; 43: 471-473.
2. Donmez H, Mavili E, Kaya MG, Soylu SO, Toker B. Endovascular treatment of coronary steal. Cardiovasc Revasc Med. 2011; 12: 67.
3. Saghvi AB, Diaz Fernandez JF, Gomez Menchero AE. Transradial occlusion of a large intercostal branch of a left internal mammary artery graft with the novel amplatzer vascular plug 4 using a 5 French diagnostic catheter: treatment of coronary steal phenomenon. J Invasive Cardiol. 2011; 23: E113-E116.
4. Cay S, Korkmaz S, Guray U. Transcatheter coil occlusion of a side branch of the left internal mammary artery graft causing signify ischemia. Acta Cardiol. 2008; 63: 399-400.
5. Namking M, Woraputtaporn W, Suarchawaratna S, Chaijaroonkhanarak W, Khamanarong K. Incidence of the accessory internal thoracic artery and its safety area in the thoracic wall. J Med Assoc Thai. 2011; 94: 1500-1503.
6. Lakkireddy DR, Lanspa TJ, Mehta NJ, Korlakunta HL, Khan IA. Internal mammary artery steal syndrome secondary to an anomalous lateral branch. Int J Cardiol. 2005; 101: 319-322.
7. Pagni S, Bousamra M, Shirley MW, Spence PA. Successful VATS ligation of a large anomalous brnch producing IMA steal syndrome. Ann Thorac Surg. 2001; 71: 1681-1682.
8. Selamet Tierney ES, Gal D, Gauvreau K, Baker AL, Trevey S, O'Neil SR, et al. Vasular health in Kawasaki disease. J Am Coll Cardiol. 2013; 62: 1114-1121.
9. Hoshino S, Tsuda E, Yamada O. Characteristics and fate of systemic artery aneurysm after Kawasaki disease. J Pediatr. 2015; 167: 108-112.
10. Gordon JB, Daniels LB, Kahn AM, Jimenez-Fernandez S, Vejar M. The spectrum of cardiovascular lesions requiring intervention in adults. JACC Cardiovasc Interv. 2016; 9: 687-696.