
Case report - Vascular thoracic

Aorta non-touch coronary artery bypass grafting after total arch replacement for acute type A aortic dissection

Yosuke Takahashi*, Yasushi Tsutsumi, Osamu Monta, Hirokazu Ohashi

Department of Cardiovascular Surgery, Fukui Cardiovascular Center, 2-228 Shinbo, Fukui 910-0833, Japan

Received 22 May 2009; received in revised form 17 July 2009; accepted 20 July 2009

Abstract

We report successful surgical treatment of coronary artery disease (CAD) in a 53-year-old man. The man was admitted to our hospital due to severe anterior chest pain. He had a surgical history of total arch replacement for acute type A dissection 10 years previously. Angiography showed triple-vessel disease and partial dissection of the descending aorta. To avoid excessive excision and to perform surgery safely, we chose aorta non-touch techniques for coronary artery bypass grafting (CABG). The postoperative course was uneventful and the patient was discharged 30 days after surgery.

© 2009 Published by European Association for Cardio-Thoracic Surgery. All rights reserved.

Keywords: Coronary artery bypass grafting; Aorta non-touch technique; Acute aortic dissection

1. Introduction

Acute type A aortic dissection is usually an unstable condition which is treated by emergency surgery without examining for coronary artery disease (CAD). Recently, it has been reported that the incidence of concomitant CAD in patients with acute type A dissection is 12.2% or 34.8% [1]. However, until now, there has been no reported case of coronary artery bypass grafting (CABG) as a redo-surgery for CAD after total arch replacement in patients with type A aortic dissection. We report on a successful CABG procedure 10 years after total arch replacement for acute type A aortic dissection.

2. Case report

A 53-year-old man was admitted to our intensive care unit with a two-day history of chest pain. He had a history of acute type A aortic dissection (retrograde DeBakey IIIB) 10 years previously. Total arch replacement was performed with a 26-mm prosthetic graft using the elephant trunk procedure. The site of arterial cannulation was axillary artery. After repair of the aortic stump with internal and external Teflon felt strips, the prosthetic graft was anastomosed proximally at the sinotubular junction. On admission, an electrocardiogram showed ST segment elevation in anterior chest leads. Enhanced computed tomography (CT) showed no residual false lumen at the ascending aorta but there was a partially patent false lumen at the descending aorta inserted elephant trunk (Fig. 1a). False lumen from descending aorta to thoracoabdominal aorta had been thrombosed and disappeared. Emergent coronary angiography demonstrated triple-vessel disease with severe stenosis of the left anterior descending artery (Fig. 1b), right coronary artery (Fig. 1c) and left circumflex artery (Fig. 1d). As the patient had severe triple-vessel disease and residual focal dissection existed in the distal arch, it was difficult to perform percutaneous coronary intervention without percutaneous intra-aortic balloon pumping. Since his chest pain disappeared and ST segment elevation was relieved by medical therapy, elective surgery was scheduled for seven days after admission.

External defibrillating pads were pasted before surgery and median sternotomy was performed. Since extremely severe adhesion around the prosthetic graft was anticipated, we selected aorta non-touch techniques. Although the bilateral internal thoracic artery (ITA) was adhering slightly to the mediastinal pleura, especially behind the sternum, harvesting the bilateral ITA was easy. After the right gastroepiploic artery was harvested, cardiopulmonary bypass was established with venous drainage by femoral cannulation and femoral arterial return. The heart was dissected free from dense pericardial adhesion. Under on-pump beating heart, the right ITA was anastomosed to the left anterior descending artery and the left ITA was anastomosed to the posterolateral branch. The right gastroepiploic artery was anastomosed to the right coronary artery.

Postoperative enhanced CT showed all bypass grafts were patent without stenosis (Fig. 2a, b). The patient recovered well and was discharged 30 days after surgery.

*Corresponding author. Tel.: +81-776-54-5660; fax: +81-776-53-2132. E-mail address: ysk@msic.med.osaka-cu.ac.jp (Y. Takahashi).

© 2009 Published by European Association for Cardio-Thoracic Surgery
3. Discussion

Although various proximal reoperations after repaired acute type A aortic dissection have been reported [2–4], none of the studies reported on the eventual need for CABG or coronary angioplasty among patients who had undergone repair of acute type A aortic dissection. Reoperations of proximal aortic surgery mainly involved the aortic root or valve and merely included CABG. Estrera and colleagues reported that 8% of CABG reoperations were in the proximal aorta [2], but did not provide detailed information about CABG.

As the mortality rate in type A dissection increases from 1% to 3% per hour during the first couple of days after onset [4], there is not enough time to search for CAD in patients who present with acute dissection. Moreover, coronary angiography can itself cause aortic rupture and the usefulness of the procedure is unclear. However, there have been some reports about the effectiveness of preoperative search for CAD [1]. When CAD was detected before surgery, it was possible to perform concomitant CABG during repair of acute type A dissection. Although the percentage of complicated CAD in acute type A dissection seems to be relatively high [1], there have been few reports about reoperative CABG after repair of type A dissection [2]. The reason why this discrepancy occurred was unclear. This is the first report of a successful case of reoperative CABG using all in-situ arterial grafts after total arch replacement.

Fig. 1. Enhanced computed tomography showing focal residual dissection in descending aorta (a). Coronary arteriography showed there was severe stenosis in the left anterior descending artery (b), left circumflex artery (c), and right coronary artery (d). The arrows indicate the stenotic sites.
for acute type A aortic dissection. We were able to obtain satisfactory postoperative results by using aorta non-touch techniques. In redo CABG after repaired aortic dissection, graft selection and revascularization methods are major concerns. As patency of proximal anastomosis using a vein graft on the prosthetic tube graft has been reported to be the same or unclear compared with that using a vein graft on the ascending aorta [5], we selected all in-situ arterial grafts using aorta non-touch techniques. This technique was considered to be safe and less invasive at the time of redo operation. An alternative technique for this patient was the use of a sutureless anastomotic device on the descending aorta for proximal anastomosis of the vein graft. Kai et al. demonstrated satisfactory results of midterm patency rate after placement of SVGs with a PAS-Port device [6].

We performed successful CABG in a patient with a history of total arch replacement for aortic dissection. The aorta non-touch technique using all arterial grafts was a useful approach for performing the operation without any complications.

References


