Coronary artery bypass graft surgery in a pediatric patient with a giant coronary aneurysm

Mete Gürsoy,1 Ece Salihoğlu,2 Salih Özçoğanoğlu,2 Süleyman Özkan2

Received: February 07, 2014 Accepted: August 21, 2014 Published online: February 10, 2015

CASE REPORT
A nine-year-old boy with KD was admitted to our institution with complaints of chest pain and fatigue. The patient’s history revealed KD. He experienced the first attack at the age of two with prolonged fever. Neither intravenous gamma globulin nor steroid therapy was given. Laboratory examination showed leukocytosis, high C-reactive protein, and elevated liver enzymes. Echocardiography showed pancarditis and a giant calcified and thrombotic coronary artery aneurysm. The diameter of the left main coronary artery aneurysm was measured as 40 mm. The patient was enrolled in a treadmill exercise test according to the modified Bruce protocol. Ischemic signs were found in the anterior leads. Coronary angiography revealed a giant left main coronary artery aneurysm, a totally occluded left anterior descending artery, and a diffusely diseased circumflex artery (Figure 1). The patient underwent CABG with upper mini-sternotomy. Perioperatively, the giant calcified coronary aneurysm was seen between the aorta and the pulmonary artery (Figure 2). Myocardial protection was achieved with antegrade cold blood cardioplegia and topical cooling. In situ, the left internal thoracic artery – the first obtuse margin branch of the circumflex artery, and the right internal thoracic artery – the left anterior descending artery anastomoses were performed under cardiopulmonary bypass. The aneurysm wall was calcified and non-resectable. The postoperative course was uneventful. Dual antiplatelet therapy was started and the patient was discharged at the postoperative seventh day in a good condition. The patient's coronary artery bypass grafting; Kawasaki disease.

Keywords: Aneurysm; coronary artery bypass grafting; Kawasaki disease.
cardiologic follow-up data was reviewed retrospectively and the postoperative course was found uneventful without angina pectoris and ideal functional capacity.

**DISCUSSION**

Coronary artery aneurysm occurs in approximately 20% of untreated patients with KD, whereas it accounts for only 4% to 8% of children who receive intravenous gamma globulin. Currently, early high-dose intravenous gamma globulin is accepted as the standard initial therapy. Late intravenous gamma globulin administration may also decrease inflammation, but may not be able to prevent coronary artery lesions. In the presence of clinical suspicion, persisting fever less than five days may be considered to be a positive diagnostic criterion and intravenous gamma globulin can be employed. Chen et al. analyzed nine studies investigating the progression of coronary involvement in KD and concluded that the combination of a corticosteroid with the conventional regimen of intravenous gamma globulin as the initial treatment strategy might reduce the risk of coronary abnormality. Currently, TNF alpha antagonists are used, particularly in patients with intravenous gamma globulin resistance. Therefore, our patient was considered inappropriate for TNF alpha antagonist therapy due to late presentation.

Kawasaki disease generally affects proximal segments of the coronaries. In our patient, the left anterior descending artery was diffusely diseased and the circumflex artery was segmentally involved. Our patient received neither immunoglobulin nor steroid therapy previously and experienced prolonged periods of fever several times. The association of prolonged fever with coronary artery lesions has been well established. Frequent cardiac imaging in fever episodes may be helpful, since children cannot distinguish ischemic symptoms.

Although coronary aneurysms due to KD may be asymptomatic, myocardial infarction and rupture are life-threatening complications which are rarely reported in the literature. Aneurysms may cause thrombosis, distal embolization, calcification, coronary stenosis, myocardial ischemia, infarction, rupture, cardiac tamponade and even death. Akagi et al. reported a 1.5% incidence of myocardial infarction in patients with a giant coronary artery aneurysm during a four-year follow-up period. Coronary aneurysms do not tend to rupture except in acute illness. Ruptured aneurysms have been noted as case reports and, to the best of our knowledge, there is no satisfactory study investigating the incidence and risk factors for aneurysm rupture. The selection of the ideal surgical technique is still controversial. In symptomatic patients, CABG with or without aneurysmectomy is the preferred approach. Aneurysmectomy can be
performed in selected cases, however, it may cause difficulties in revascularization and the protection of branches. On the other hand, ligation of the aneurysm and distal bypass is a controversial alternative due to the risk of subsequent graft failure.[13] Coronary artery bypass graft surgery with internal thoracic artery graft is the gold standard in patients suffering from myocardial ischemia.[13] The internal thoracic artery is the preferred graft with a high long-term patency rate.[13] In our patient, we utilized bilateral internal thoracic artery grafts for revascularization.

In conclusion, giant coronary aneurysm is a very rare and life-threatening complication of KD. Early diagnosis and aggressive treatment may prevent aneurysm formation. Coronary artery bypass grafting is a safe and preferred approach with encouraging long-term results in patients suffering from myocardial ischemia.

Declaration of conflicting interests
The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding
The authors received no financial support for the research and/or authorship of this article.

REFERENCES