procedure (eg, the risks of redo sternotomy to perform the second procedure [LVRS]). Even if one is performing a video-assisted thoracoscopic LVRS after CABG, there are likely to be adhesions relating to previous opening of the pleura to harvest the internal thoracic artery for use as a conduit. Pleural adhesions can make LVRS difficult and are associated with increased morbidity.

In summary, a multidisciplinary team approach has allowed this patient to undergo a successful combined LVRS and CABG. The ability to safely carry out a combined cardiac procedure and LVRS has important implications and advantages.

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Off-pump revascularization with the use of both internal thoracic arteries in a 3-year-old child with Kawasaki syndrome

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Kawasaki syndrome is a generalized vasculitis of unknown origin. Giant coronary artery aneurysms develop in 0.27% of cases.[1] We present the case of a 3-year-old boy with Kawasaki disease with giant coronary artery aneurysms after myocardial infarction. The patient underwent successful revascularization with both internal thoracic arteries (ITAs).

CLINICAL SUMMARY

A $3\frac{1}{2}$ -old-boy had a history of acute Kawasaki disease in September 2003 at the age of 4 months, with giant coronary artery aneurysms (Figures 1 and 2) after standard treatment in the acute stage. During 32 months of follow-up he received treatment with an oral anticoagulant and aspirin, remaining in good general condition with a normal ejection fraction (EF) on transthoracic echocardiography (TTE).

In April 2006 after a varicella infection, his mother noticed slight cyanosis around the mouth, pale skin, and weakness. Physical examination revealed tachycardia, a third heart sound, and a systolic murmur at the apex. On the electrocardiogram, new pathologic Q waves were seen in leads II, III, and aV_F. Myocardial damage markers were in the normal range. TTE revealed severe left ventricular dysfunction. The apex and the anterolateral part of the left ventricle were akinetic. This was also confirmed by thallium scintigraphy.

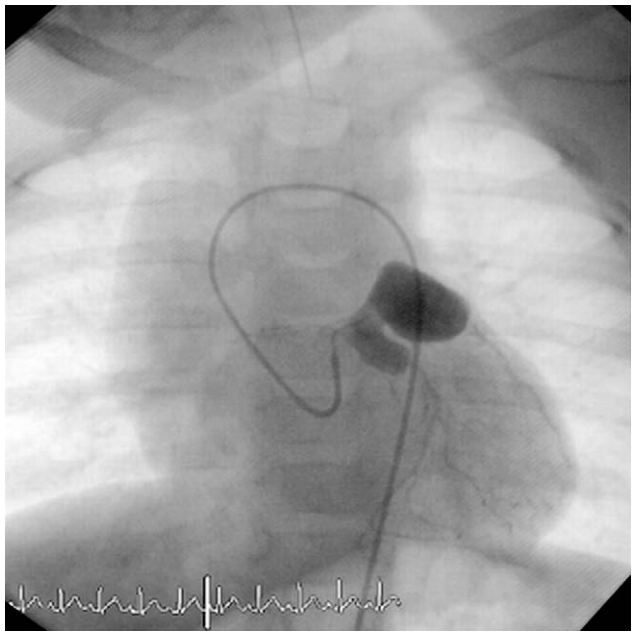

FIGURE 1. Frontal projection of selective LCA injection showing the large aneurysm involving left main and proximal aspects of LAD and circumflex coronary arteries—acute stage.

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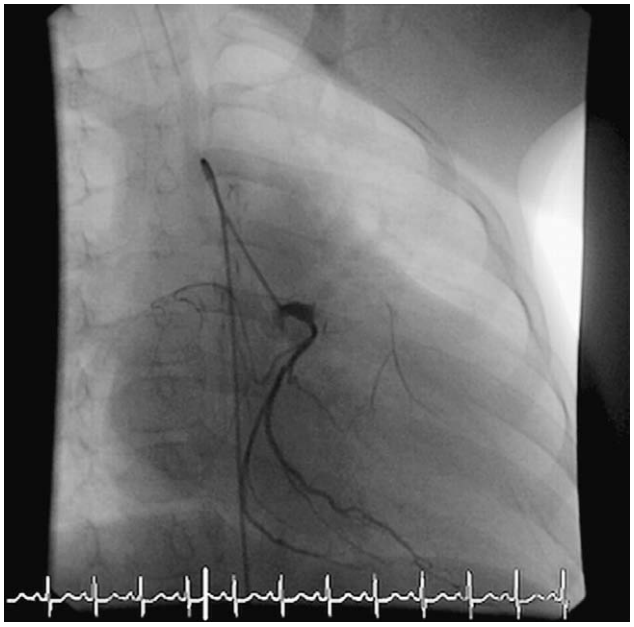

FIGURE 2. Right anterior oblique projection of selective LCA injection showing occlusion of the proximal segment of LAD—before the operation.

A 64-slice computed tomogram was performed to image peripheral coronary aneurysms and the ITAs. Coronary angiography revealed thrombosis in the aneurysm of the proximal part of the right coronary artery with collateral filling of the distal part and thrombosis in the aneurysm of the left coronary artery (LCA) with total occlusion of the left anterior descending (LAD) (Figure 2) and sufficient filling of the circumflex coronary artery.

The operation was scheduled in July 2006 but was postponed because of a viral infection. Progressive heart failure and further decrease of EF to 15% on the TTE were observed. In November 2006 during subsequent coronary angiography (comparable data to the previous examination) the patient's condition deteriorated with transient bradycardia and after stabilization with atropine and inotropic drugs, he was transferred to the operating room in stable condition 4 hours later.

The chest was opened through a median sternotomy, and the pericardium was opened longitudinally. Examination of the heart revealed a significantly enlarged left ventricle with poor contractility and an aneurysmal proximal part of the LAD. The left and right ITAs were harvested with a Finochietto retractor. Systemic heparin was administered (2 mg/kg). The epicardium was transected, exposing the middle portion of the intramyocardial LAD. The LAD was snared proximally and distally with 6-0 polypropylene suture. On the beating heart, with the use of an Octopus tissue stabilizer (Medtronic Inc, Minneapolis, Minn), an anastomosis between the left ITA (1.5 mm) and the LAD (1 mm) was performed with 8-0 polypropylene running suture. The right ITA (1.5 mm) was grafted in the same fashion to the right coronary artery (1.5 mm). During the procedure, the arterial pressure was stable. After completion of the anastomosis, protamine sulfate was given. The patient was transferred to the intensive care unit in hemodynamically stable condition and was extubated within 6 hours. The total amount of blood loss was about 150 mL. The next day he was moved to the ward in stable condition. He was discharged from the hospital within 22 days in good clinical condition. During 15 months' follow-up, he is still in good general condition with an EF of 30% on TTE.

DISCUSSION

The major complication of Kawasaki disease with myocardial infarction is caused by thrombus formation inside the aneurysm or by an organic obstructive lesion after regression of the aneurysm.[2] The ITA is a conduit with potential for growth and adaptation. This growth potential may be the most important reason for its excellent long-term patency, which suggests that the in situ ITA graft is the graft of choice for pediatric coronary artery bypass grafting.[3]

The first minimally invasive coronary artery bypass graft in Kawasaki disease was reported by Nabuchi and Sonobe[4] in 2001. An 8-year-old child underwent surgical revascularization to the LAD via a left anterior short thoracotomy with the heart beating.

To our knowledge, this is the first reported case of off-pump surgery with bilateral ITAs in Kawasaki disease in a 3-year-old child after a large myocardial infarction. The off-pump coronary artery by-pass method was used because of following reasons: contractility of the heart was exceptionally low, stable op-field was possible to achive, there are better results in adult patients with low EF operated on without extracorporeal circulation[5] and the 10-year personal experience of the surgeon.

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