Giant coronary artery aneurysm arising from the sinus node artery with a fistula into the left atrium

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Abstract

Giant sinus node artery aneurysms with a fistula into the left atrium are extremely rare. A 76-year old woman was admitted to our hospital for an abnormality on her chest X-ray. Coronary computed tomography (CT) angiogram revealed a giant coronary aneurysm with feeding arteries arising from the sinus node artery and the left circumflex artery. Additionally, the aneurysm had a fistula into the left atrium. The size of aneurysm was 70 × 50 mm. Coronary angiography showed contrast dye drained from the aneurysm to the left atrium through the fistula. Surgical treatment was performed. After feeding arteries were ligated, the aneurysm was opened under routine cardiopulmonary bypass. The diameter of the fistula entry was found to be 2 cm, and it was closed using a patch material. Since we were not able to identify the anatomical relationship of the fistula, mitral valve and pulmonary veins through the origin of the fistula, we used an additional right lateral left atriotomy approach. The aneurysmal wall was resected, and the cause of aneurysmal change was histopathologically diagnosed as atherosclerosis. The patient’s postoperative course was uneventful, with a postoperative CT showing a complete exclusion of the aneurysm.

Keywords: Coronary artery aneurysm • Sinus node artery • Coronary arterial fistula

INTRODUCTION

Coronary artery aneurysm is a rare disease, found mainly during coronary angiography, with a reported incidence of 0.15–4.9% [1]. While a giant coronary artery aneurysm (GCA) is not precisely defined necessarily by size, many GCA cases have been reported. Among these reports, a GCA with a fistula into the left atrium is extremely rare. Moreover, the GCA in our case arose from both the sinus node artery and the left circumflex artery. As a result, we report the first case of successful surgical repair of a GCA arising from the sinus node artery with a fistula into the left atrium.

CASE REPORT

A 76-year old woman was admitted to our hospital because of an abnormality on her chest X-ray. Chest radiography showed a giant mass in the left middle mediastinum. Coronary computed tomography (CT) angiogram revealed a giant coronary aneurysm with feeding arteries arising from the sinus node artery and the left circumflex artery. Additionally, the aneurysm had a fistula into the left atrium (Fig. 1A–C). The size of the aneurysm was 70 × 50 mm. Coronary angiography showed the aneurysm with feeding arteries from the sinus node artery and the left circumflex artery, and contrast dye draining from the aneurysm to the left atrium through the fistula (Fig. 2A and B).

While a giant coronary artery aneurysm (GCA) is not precisely defined by size, many GCA cases have been reported. Among these reports, a GCA with a fistula into the left atrium is extremely rare. Moreover, the GCA in our case arose from both the sinus node artery and the left circumflex artery. As a result, we report the first case of successful surgical repair of a GCA arising from the sinus node artery with a fistula into the left atrium.

Surgical treatment was performed. The feeding arteries from the right and left coronary arteries ran behind the pulmonary artery. The feeding artery arising from the sinus node artery was observed along the transverse sinus. After adhesions around the aneurysm were dissected and the feeding arteries were ligated, the aneurysm was opened under routine cardiopulmonary bypass and cardiac arrest. While ligation of the sinus node artery can initiate postoperative supraventricular arrythmia, sacrifice of the feeding artery from the sinus node artery did not affect this patient’s heart rhythm. The entry part of the fistula was 2 cm in diameter and was closed using a Xenomedica patch (Baxter Healthcare Corp., Horw, Switzerland). Since it was impossible to detect the intracardiac structures through the origin of the fistula, we used an additional right lateral left atriotomy approach. The aneurysmal wall was resected, and the cause of aneurysmal change was histopathologically diagnosed as atherosclerosis. The patient’s postoperative course was uneventful, with a postoperative CT showing a complete exclusion of the aneurysm and feeding arteries (Fig. 1D and E).

DISCUSSION

GCAs are rare, ranging in size from 50 to 150 mm [2]. The most common cause is atherosclerosis, and the right coronary artery is most frequently involved [3]. GCAs arising from the sinus node artery are very rare [4, 5]. On the other hand, GCAs with fistulas are also uncommon, with most cases being congenital. GCAs with fistulas into the right atrium, right ventricle, left ventricle or
pulmonary artery have been reported. In our case, the GCA arose from the sinus node artery and the left circumflex artery and had a fistula into the left atrium, and, to the best of our knowledge, this complication has never been reported. Generally, GCA with fistula has complications including thrombosis, embolization, rupture, congestive heart failure and infective endocarditis. However, clinical symptoms are due to the site of the fistula, and, in the case of GCA with a fistula into the left atrium, this complication did not have a significant effect on the patient’s haemodynamic status.

General surgical repair for GCA with fistula is resection of the aneurysm, reconstruction of the coronary artery and repair of the fistula. If the diameter of fistulous ostium is more than 10 mm, patch repair is recommended [2]. Since the feeding arteries and the aneurysm were located behind the pulmonary artery, we were not able to identify the anatomical relationship of the fistula, mitral valve and pulmonary veins through the origin of the fistula, and it was impossible to complete the combination of ligation of the feeding arteries and transaneurysmal patch repair of the fistula in this approach. Therefore, we used an additional right lateral left atriotomy approach for patch repair of the fistula, and we confirmed that there was no blood leakage into the aneurysm after the aneurysm opened. We believe that this approach was a reliable procedure for this case, and this is the first case of the successful surgical repair of a GCA arising from the sinus node artery with a fistula into the left atrium.

Conflict of interest: none declared.
REFERENCES