Late Ruptured Giant Left Ventricular Pseudoaneurysm Following Myocardial Infarction: Case Report

Miyokard İnfarktüsüne Bağlı Dev Sol Ventrikül Psödoanevrizma Geç Rüptürü

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ABSTRACT Three months after myocardial infarction, a 52-year-old man was admitted to emergency department with symptoms of cardiogenic shock. Transthoracic echocardiography revealed a giant pseudoaneurysm of the left ventricular free wall. Pseudoaneurysm's dimension was 8×10 cm. Moreover, a minimal thrombus formation in the pericardial area and perforation of the pseudoaneurysm were documented by late enhancement. Coronary angiography revealed total stenosis of the left circumflex and proximaly right coronary artery and minimal occlusion of the left coronary artery; ventriculography showed pseudoaneurysmal rupture of the left ventricle. The patient transferred urgently to the operating room and the operation initiated. Ruptured zone under the heart lung pump the linear repair was performed successfully. Patient was discharged succesfully at the 20th postoperative day.

Key Words: Aneurysm, false; myocardial ınfarction

ÖZET Üç ay önce miyokard infarktüsü geçirmiş 52 yaşındaki erkek hasta kardiyak şok tablosunda acil servise başvurdu. Transtorasik ekokardiyografide sol ventrikül serbest duvarından kaynaklanan dev psödoanevrizma tespit edildi. Psödoanevrizma 8x10 cm çapında idi. Bunun dışında perikardiyal aralıkta az miktarda trombüs varlığı ve geç dönem psödoanevrizma perforasyonu bulgularına rastlandı. Koroner anjiografide sirkumfleks koroner arterde tam kat oklüzyon, sağ koroner arter proksimalinde oklüzyon ve sol ön inen koroner arterde önemsiz darlık tespit edildi. Ventrikülografide psödoanevrizma rüptürü olduğu görüldü. Hasta acil olarak ameliyathaneye transfer edilerek operasyona başlandı. Rüptür sahası kalp akciğer pompası yardımıyla lineer olarak tamir edildi. Hasta postoperatif 20. günde sağlıklı durumda taburcu edildi.

Anahtar Kelimeler: Anevrizma, yalancı; miyokard infarktüsü

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One of the important complications of transmural myocardial infarction is the rupture of the left ventricul free wall that is usually mortal. In some cases, this rupture is limited by a hematoma which allows patient to survive. Afterwards, this haematoma turns into a fibrous cavity that is associated with left ventricle and pseudoaneurysm occurs.[1] These pseudoaneurysm structures does not contain myocardial cell tissue and mostly are located at the posterior wall of the ventricule. Pseudoaneurysms are prone to a sudden rupture.[2] Hence surgical repair shouldn't be delayed. Our aim by presenting this case is to discuss the diagnosis of giant pseudoaneurysm rupture, and the operative procedure.

CASE REPORT

A 52 years old male patient with a thransthoracic echocardiographical pre-diagnosis as a pericardial tamponade and suspicious aortic dissection existance by an another clinic was administered to our emergency department in a cardiogenic shock status. By his initial physical examination, we observed tachycardia, tachypnea, global coldness of skin with non-cooperative neurological state. Thus, an endotracheal intubation was performed.There were no signs of hepatomegaly and jugular venous distension. Arterial blood gases analysis depicted a 7.0 pH and base excess with -15 mmol/L. A bedside transthoracic echocardiography was possible at the intensive care unit due to poor visibility. A medical history was reported by his parents with a medical center administration for sickness 3 months ago (myocardial infarction?). At that time, patient continued to his daily life with medications. However, his clinical condition was said to be worsened suddenly 2 hours ago. Afterwards, he was brought to an emergency department. We performed a rapid transfer to catheter laboratory for a coronary angiography and ventriculography. A proximal total occlusion of right coronary artery, a total occlusion of circumplex artery right after first optus margin branch and a 30-40% stenosis of left anterior descending artery were observed. By the ventriculography, we viewed a pseudoaneurysm arising from the posterior wall in a diameter of 8x10 cm (Figure A). By its perforation, nearby the left and right atrial chambers, we demonstrated a free flow (2x7 cm). In both chambers, blood was sucked back into ventricle during the diastolic phase and re-filled into the chambers at the systolic phase (in-and out mechanism). This pattern was considered to be the patient's survival reason.

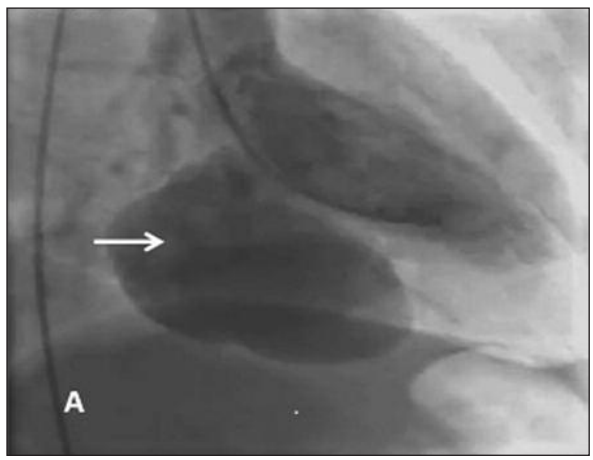

FIGURE 1A: An angiographic view of the pseuduaneurysm.

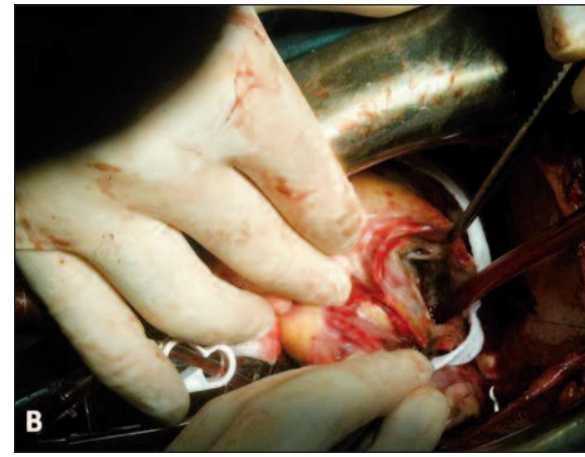

FIGURE 1B: Intraoperative view of the pseuduaneurysm.

Patient underwent to emergent surgery. Heparin was administared in a dosis of 100-300 u/kg after median sternotomy before pericardiotomy. By an activated clotting time (ACT) level over 400 seconds, we set a passive replacement mechanism (suction blood was transfered to right atrial chamber from its auricle). Blood pressure was maintained by suction and passive replacement. We reached to cardiopulmonary bypass after a standart cannulation. Thus, heart was emptied. Cardiac arrest was reached by antegrade cardiopledgia. An old rupture of free left ventricle wall was observed within a size of 5x5 cm (Figure 1B). Circumflex artery was also in this region and the right coronary artery was not suitable for a bypass. After the determination of the boundaries of the perforation, we performed a ventricle repair by double layer continuous suture technique over a teflon patch by 3:0 polypropylene. We applied fibrine glue (polyetilene glycole-Coseal) on the suture line to prevent leakage. Heart contracted spontaneously and weaning from cardioplumonary was achieved with inotropic medication support. Mechanical ventila-

tion was continued for 5 days due to metabolic encephalopathy. In the sixth day, we performed a tracheotomy. Patient was discharged at the 20th postoperative day with total awakeness and complete motor function recovery.

DISCUSSION

Left ventricle free wall rupture incidence is 4% among acute myocardial infarctions[3]. This complication presents a high mortality risk. Rarely, rupture side is limited by its neighboring pericardial tissue, performing a pseudoaneurysm. Pseudoaneurysms are consisted of a slim neck connecting to left ventricle cavity. Aneurysm wall is solely performed by fibrous pericardial tissue, without any myocardial elements. Left ventricle pseudoaneurysms are generally caused by circumflex artery occlusions[4]. Usually, they arise from inferior, posterior or lateral walls. As a general rule, anterior free wall originating ruptures are not limited by a neighboring pericardial tissue which leads to hemopericardium, cardiac tamponade and end-point of death.[5]

In our case, there was a chronic left ventricle wall rupture due to circumflex and right coronary artery occlusions which we estimate to happen 3 months ago. Echocardiography, magnetic resonance imaging and contrast tomography can be used for diagnosis of left ventricular pseudoaneurysms.[6,7] However, in our case coronary angiography and additive ventriculography is mandatory due to the necessity of a concurrent aneurysmectomy with coronary bypass surgery. In our case, we achived sufficient clinical data solely by echocardiography and ventriculography with coronary angiography due to the emergency nature of the situation.

As we depicted by our pictures and also in intraoperative observations, the pseudoaneurysm area did not present a slim neck which we believe to be an illusion depending on this large scale of rupture. We also have seen intraoperatively that there was a very thin pseudoaneurysm capsule without any evidences of cloth formation (Figure 1B). We believe that pericardium was able to build up a good limitation. More importantly, the in-and out mechanism, which was explained above, was a result of this bigger rupture.

Furthermore, as a surgical technique, we advocate heparinization before pericardiectomy because, massive bleeding, which may occur by the opening of the pericardium, and, in such cases passive or active circulation is helpful techniques.

RESULT

Left ventricular pseudoaneurysms have lifethreatining complications such as rupture that requires urgent surgical approach. Hence quick methods should be used for diagnosis such as echocardiography, coronary angiography that is essential for the revascularization procedure and additional ventriculography guides the surgeon to perform the appropriate procedure. Passive and active circulation techniques are lifesaving strategies, hence heparinization should be completed before pericardiotomy. We represent a case of successfully treated left ventricular pseudoaneurysm rupture.

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