

Hemiarch reconstruction in a patient with aortic root dissection after the previous CABG: a case report

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May 10, 2022

Abstract

Background: Aortic root aneurysms are traditionally treated by open surgery methods, which significantly increase the risk of postoperative complications. Elderly patients with a history of previous cardiac surgery have a higher risk of postoperative events and demand more careful supervision during hospitalization. **Materials & Methods:** We report a case of a 72-year-old female patient with aortic root aneurysm and a previous history of cardiac surgery (CABG) with a high risk for EuroSCORE II (15,52%). The postoperative period was uneventful. **Discussion and Conclusion:** We use this case to discuss the effectiveness and short-term results of this procedure in patients with high risk. **Keywords:** aortic aneurysm, CABG, hemiarch reconstruction

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Conflict of interest : none

Financial support : The authors hasn't any financial interest in the submitted materials or methods. **Compliance with the ethics principles :** informed consent for treatment and publication is obtained from patient.

Background: Aortic root aneurysms are traditionally treated by open surgery methods, which significantly increase the risk of postoperative complications. Elderly patients with a history of previous cardiac surgery have a higher risk of postoperative events and demand more careful supervision during hospitalization. **Materials & Methods:** We report a case of a 72-year-old female patient with aortic root aneurysm

and a previous history of cardiac surgery (CABG) with a high risk for EuroSCORE II (15,52%). The post-operative period was uneventful. **Discussion and Conclusion:** We use this case to discuss the effectiveness and short-term results of this procedure in patients with high risk.

Keywords: aortic aneurysm, CABG, hemiarch reconstruction

Introduction:Case presentation:The 72 years old female was admitted to the S.G. Sukhanov Federal Center of Cardiovascular Surgery (Perm, Russia) for examination, where she was diagnosed with aortic root pseudoaneurysm in May 2021. The patient suffered from coronary heart disease since 2011 (angina pectoris III FC), in 2012 she underwent CABG (six bypasses using great saphenous vein). Aortic root pseudoaneurysm was detected by transthoracic echocardiography. The image showed a pseudoaneurysm of the ascending aorta, obturated with thrombotic masses on 50% of the aortic lumen. Pseudoaneurysm spreaded from the aortic root to the aortic arch. Aortic valve was intact. On multispiral computer tomography large pseudoaneurysm of root and ascending part of the aorta with partial thrombosis and dilation of descending aorta were found. The aortic root diameter was 25 mm, isthmus diameter – 29 mm, size of pseudoaneurysm – 74x75 mm (Figure 1). The mortality risk was high with a EuroSCORE II of 15.52% due to the patient's age, female sex, the center's estimated surgical volume, and the present comorbidities. Despite the high risk, the patient was recommended for open pseudoaneurysm resection with hemiarch reconstruction. Intraoperatively, during the revision of the pericardium cavity, there was pronounced adhesion. The distal part of ascending aorta and aortic arch were dilated with signs of aortic rupture and formation of a hematoma. The aortic valve was intact, without any signs of significant insufficiency. After revision of the aortic arch, rupture on small curvature was discovered. The affected part of the aorta was excised (Figure 2). A distal anastomosis with the aorta was performed with a vascular prosthesis according to the hemiarch technique (Vascutek 28) (Figure 3). Proximal anastomoses of venous grafts cut out on the 2 parts of the aortic wall. Then the distal anastomosis with the aorta was completed. After the restoration of cardiac activity with a partial clamp of vascular prosthesis proximal anastomoses of venous grafts were implanted. The postoperative period was uneventful.

Discussion

Our case report describes the treatment of ruptured aortic root aneurysm by the replacement of the aortic arch by vascular prosthesis with reimplantation of CABG proximal anastomoses. Type A aortic dissection is a life-threatening situation with high associated mortality [1]. Open surgical aortic repair is a typical option for aortic dissection treatment. In modern surgical practice, hemiarch is a safe and effective procedure, especially in high-volume cardiac centers with sufficient experience [2]. If the patient previously underwent other cardiac surgery procedures, it increases risks because of re sternotomy and altered mediastinum. There are a few case reports and small researches in the medical literature about the outcomes of aortic dissection in patients with previous cardiac surgery (PCS) [3-6]. Gillinov et al. after analysis of 56 patients with a history of previous cardiac surgery postulated that patients having type A dissection late after cardiac surgery infrequently have cardiac tamponade and hemodynamic collapse; they require coronary angiography. Authors underlined that postoperative mortality is low on condition of sufficient preoperative diagnostics and perioperative critical care [7]. Norton et al. found that despite the patients with PCS usually having significantly more comorbidities and the operation being more complicated, the perioperative outcomes, including mortality, were comparable to those of patients with primary operation. The long-term survival was significantly worse in patients with previous surgery; however, this circumstance was not a risk factor for operative mortality (OR= 1.6, p=0.36) or all-time mortality (HR=1.3, p=0.33) [3]. Özçınar et al. confirm this conclusion: after analysis of the medical history of 32 patients with aortic type A dissection after PCS, they found that careful planning of perioperative tactic provides results that are comparable with outcomes in patients without PCS [8]. Sandhu et al. analyzed 456 redo sternotomy cases in proximal aortic repair and found that re sternotomy is associated with increased risk for short- and long-term mortality, but the fact of PCS (aortic) did not add further risk [9]. For patients with high risk, hybrid operations can be an option [10,11].

Our patient underwent open surgery by redo sternotomy, which increased risks. Authors strongly believe that

scrupulous perioperative critical care and diagnostics can dramatically reduce risks and improve postoperative outcomes.

Conflict of interests The authors declare that there are no conflicts of interests.

Ethics statement Ethics approval was not necessary, written and informed consent was obtained from the patient. Written consent for publication of case and images was obtained from the patient

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Figures:

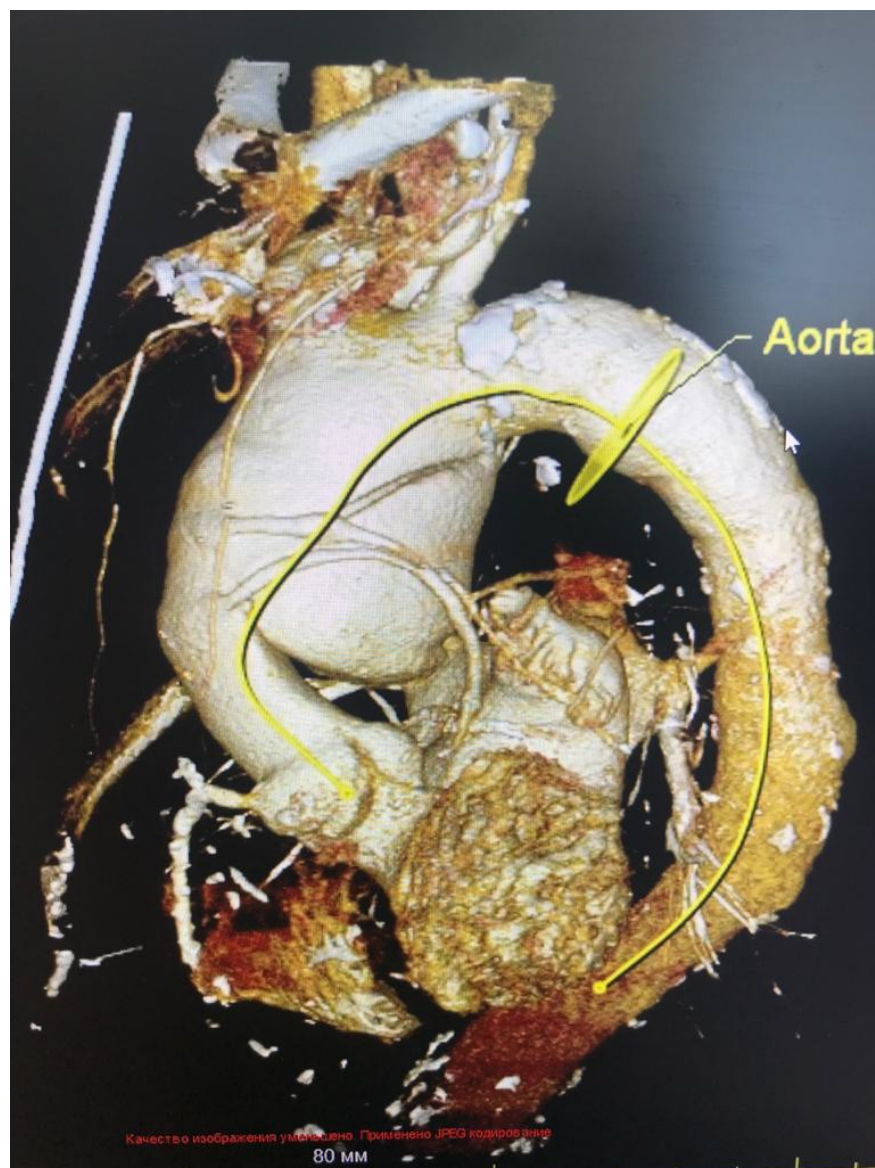


Figure 1. CT-angiography reconstruction of patient's aortic arch.

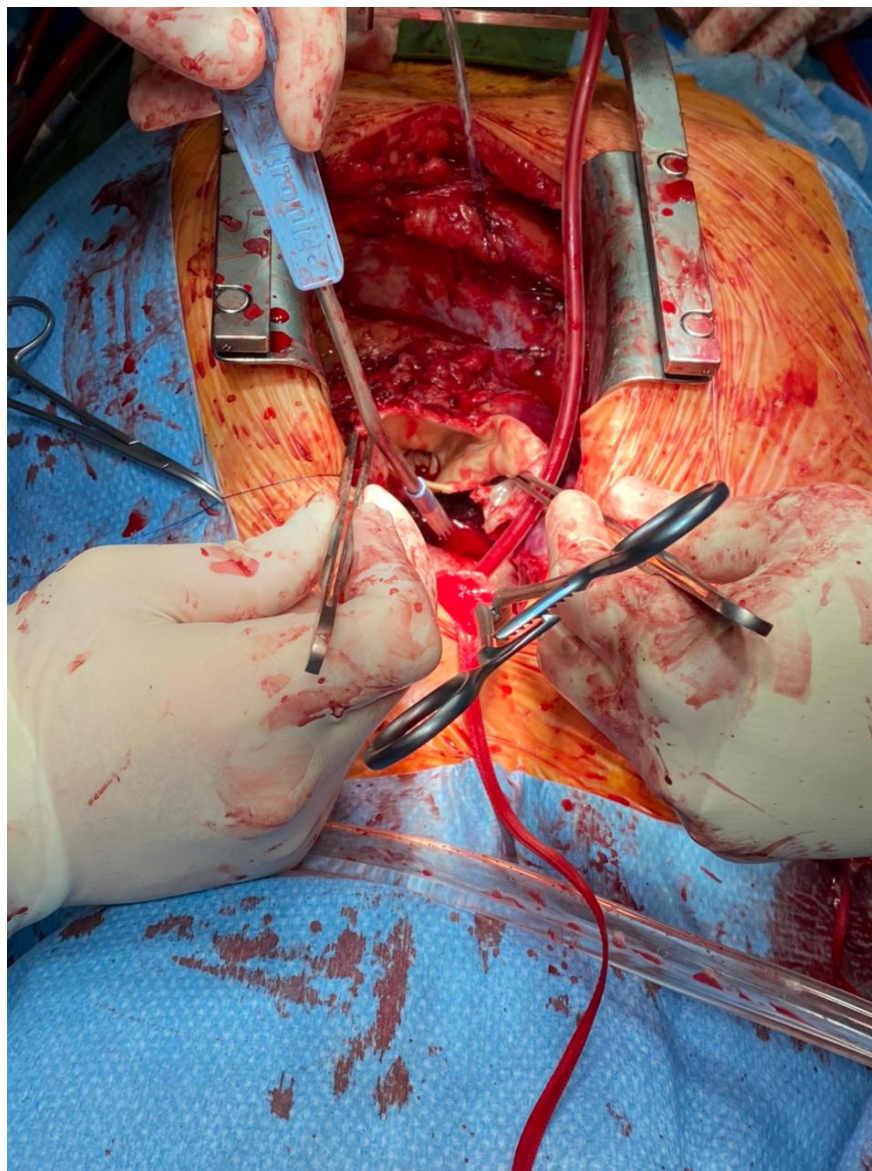


Figure 2. Pseudoaneurysm resection.

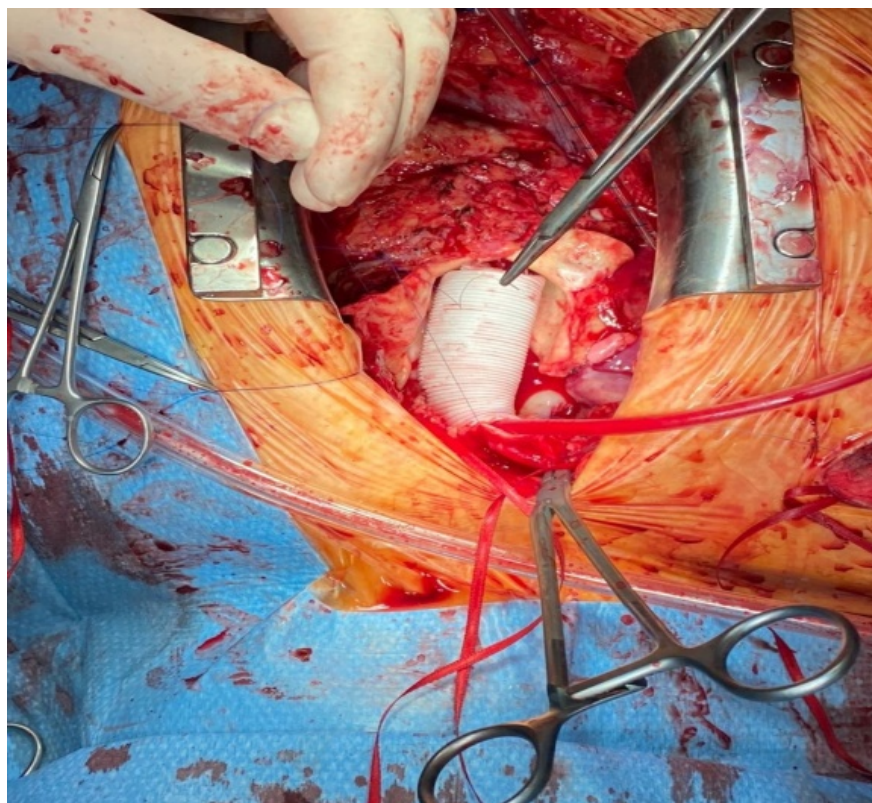


Figure 3. Distal anastomosis formation.