

Surgical management of ascending aorta pseudoaneurysm in a patient with COVID-19

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SOUHRN

Pseudoaneurysma hrudní aorty je raritní diagnóza asociovaná s vysokou mortalitou. Prezентujeme případ pacienta, u kterého vznikla velká falešná výduť deset let po provedení Bentallovy operace a jednonásobného aortokoronárního bypassu. Zároveň s daným nálezem se u něho prokázala covid-19 pozitivita. Po zaléčení pneumonie byla úspěšně provedena operace, a to sešitím dvou defektů v aortálním konduitu. Jedná se o unikátní případ, kdy pacient přežil dva život ohrožující stavy.

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ABSTRACT

Pseudoaneurysm of the thoracic aorta is a rare condition associated with high mortality. We present a case of a patient who developed a huge pseudoaneurysm 10 years after the Bentall procedure and one aorto-coronary bypass while simultaneously being COVID-19 positive. After treating pneumonia, the surgery was successfully performed with suturing two defects in the aortic conduit. It is a unique case report where the patient survived two life-threatening conditions.

Introduction

Pseudoaneurysms of the thoracic aorta are contained ruptures in which the majority of the aortic wall has been disrupted and luminal blood is contained by surrounding mediastinal structures. They have a tendency to expand quickly and are associated with high mortality. Etiologically they occur after cardiac surgery, chest trauma, or infection. A golden standard for treatment is the surgical approach but since reoperative aortic surgery is a therapeutic challenge, transcatheter closure or conservative treatment is sometimes advised.¹

Case report

A 43-year-old man after the Bentall procedure and one aortocoronary bypass ad PDA (2010) was admitted to our Institution on 9th December 2020 with a diagnosis of an aortic pseudoaneurysm. He was previously hospitalized in another hospital for sharp chest pain and exertional dyspnea, where echocardiography revealed a pseudoaneurysm on the front side of the aortic conduit. His bio-

markers of inflammation were elevated, therefore he was treated with empirical broad-range antibiotics. Before he was transferred to our institution he tested PCR negative for COVID-19 on 9th December 2020.

On admission, the PCR test for COVID-19 was repeatedly negative and his biomarkers of inflammation were elevated as well as cardiac markers. Echocardiography was performed, and a leak in the area of reimplanted RCA to the pseudoaneurysm was described. Then a chest CT scan was completed, and a diagnosis of aortic pseudoaneurysm with dimensions 77 × 107 × 44 mm was confirmed. It also revealed no significant stenosis in LAD and RD, on the other hand, RCA and Cx weren't displayed which confirmed the suspicion of RCA detachment. The pseudoaneurysm caused compression of the conduit.

The operation performance was postponed, patient's inflammation biomarkers persisted high despite the administration of two empirical antibiotics. COVID-19 antigen rapid test was performed as a part of the regular screening process on the fifth day of hospitalization with a positive result as well as a later repeated PCR test. Chest X-ray confirmed right lobar pneumonia. The patient required high nasal flow oxygen and was treated con-

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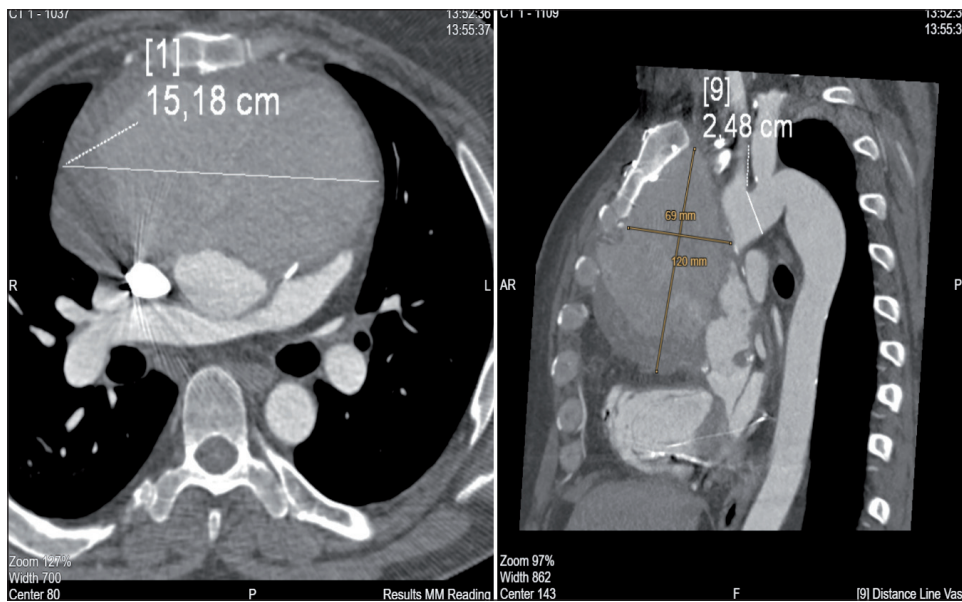


Fig. 1 – Chest CT scan before surgery.

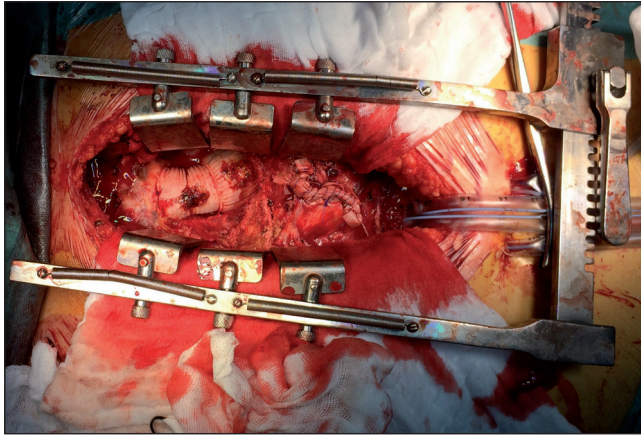


Fig. 2 – Sutured defects in conduit.

tinuously with antibiotics, steroids, and isoprinosine with good therapeutical and laboratory effects. Another chest CT scan completed before surgery on the 13th January 2021 manifested the presence of residual infiltrates on the lungs and a massive progression of the pseudoaneurysm to 150 mm with 2 possible entries (Fig. 1).

The patient subsequently underwent a cardiac operation on the 21st, January 2021 in deep hypothermia at 18 °C with cannulation of the subclavian artery and femoral vein. Two leaks were detected on the front side of the aortic conduit. The first defect was after central anastomosis of the bypass to the PDA into the conduit and the second was after reimplantation of RCA in the Bentall procedure. The first smaller defect was sutured, the second was bigger, and therefore circular suturing was performed with bovine pericardium (Fig. 2). A laceration of the right ventricle occurred during re sternotomy and it was sutured continuously with bovine pericardium as well.

Recovery was uneventful. The patient was discharged on postoperative day 6 in stable condition. Another chest

CT scan was performed one month after surgery with a favorable outcome.

Discussion

The epidemic caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is causing the loss of thousands of lives because of its highly contagious nature and unprecedented global spread, its aggressive clinical presentation, and the lack of effective treatment. Active SARS-CoV-2 infection may precipitate an overproduction of early response proinflammatory cytokines, leading to five times higher mortality and longer post-operative stay. Moreover, studies have already proven that patients with cardiovascular diseases have a greater risk of increased SARS-CoV-2 infection prognosis.²

Several case reports have published their findings of artery pseudoaneurysm and SARS-CoV-2 concomitant presence but none of those included aortic pseudoaneurysm. Some of them speculate that pseudoaneurysm development was a consequence of advanced COVID-19 infection. In our case, the pseudoaneurysm likely developed before the COVID-19 infection nonetheless, the infection accelerated its rapid progression. Nonetheless, it is not possible to reliably claim whether this is a causality or a coincidence of the aortic pseudoaneurysm and COVID-19 infection. The vascular complications after COVID-19 infection and their possible association are still under debate.³⁻⁵

Another important factor is the timing of the operation since there are still no data on cardiac surgery optimal timing in a patient with COVID-19 infection. Our decision was established to operate on the patient only after successful treatment of pneumonia acknowledging the possibility of pseudoaneurysm rupture. In conclusion, decisions to operate should be based on the severity of the disease, patient factors, and institution capacity.

Conflict of interest

None declared.

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