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## Incidental Finding of Subacute DeBakey Type II Aortic Dissection with Circular Intimal Tear in a Patient with Severe Aortic Insufficiency During the COVID-19 Pandemic

**Abstract.** We present a case of severe aortic insufficiency diagnosed in the pandemic period with the surgery being postponed due to hygiene concerns and suspicion of COVID-19. One month later the patient's complaints worsened. Renewed preoperative examinations revealed no difference and no sign of dissection. The suspicion of COVID-19 was eliminated, so immediate aortic valve surgery was performed despite the pandemic. Surprisingly subacute DeBakey type II aortic dissection with complete circular intimal tear came across intraoperatively. Thus, the modified Cabrol procedure was performed successfully. The diagnosis of aortic dissection may be missed, and this rate may increase in natural disasters such as pandemics and earthquakes.

**Keywords:** *dissecting aneurysm of aorta, SARS-CoV-2, bicuspid aortic valve disease, aortic valve insufficiency, aortic aneurysm, case report.*

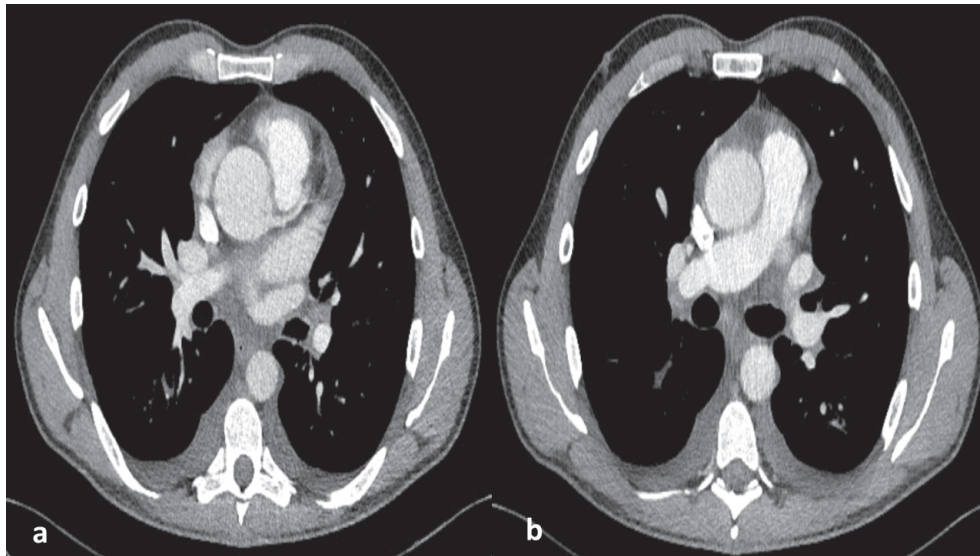
**Introduction.** Acute type A aortic dissections (AD) operations still have high death rates despite advancements in surgical techniques and strategies, particularly when perioperative malperfusion is present [1]. Conversely, COVID-19 pandemic has reduced healthcare accessibility for patients with non-life-threatening diseases, thus concealing their true incidence. Furthermore, over the course of the pandemic, there has been a marked rise in the number of cases of chronic ascending AD, but the prevalence of potentially lethal illnesses like acute type A AD appears to have reduced [2]. This suggests that during the pandemic, reduced healthcare access and postponed procedures due to hygiene concerns may result in the potential neglect of urgent and life-threatening cases, such as acute type A AD. Although contrast-enhanced computed tomography (CT) has a high negative predictive value in many studies, false negatives can occur. Thus, if the first aortic imaging is negative despite a high clinical suspicion of acute AD, a second imaging examination need to be ordered [3].

We present a case of subacute DeBakey type II AD detected intraoperatively with false-negative findings, whose elective cardiac surgery was postponed due to the COVID-19 pandemic.

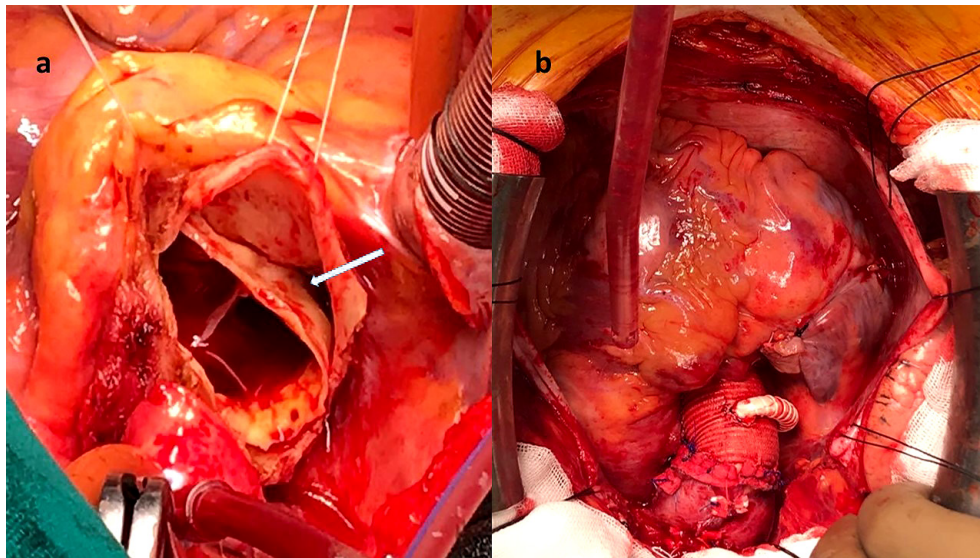
**Case report.** A 62-year-old male patient with a history of suspected endocarditis presented to our cardiology outpatient clinic with complaints of exertional dyspnea. He had a history of stage 1 hypertension and familial cardiac diseases. Transthoracic echocardiography and transoesophageal echocardiography (TEE) revealed grade 3-4 aortic insufficiency, a bicuspid aortic valve, and a coaptation defect. No evidence of AD was observed on preoperative contrast-enhanced CT and TEE. The patient was subsequently referred to our cardiac surgery clinic for further evaluation.

Honeycomb appearance on the chest CT scan during the preoperative evaluation prompted suspicion of COVID-19. Despite a negative polymerase chain reaction result, the patient was commenced on treatment based on the CT findings. Additionally, the CT scan revealed an ascending aorta diameter of 4 cm (Fig. 1).

Consequently, the elective surgery of the patient was postponed to a later date. One month later, the patient's complaints had worsened, and the results of the renewed preoperative examinations revealed no difference and no sign of AD. Consequently, the suspicion of COVID-19 was eliminated, and immediate aortic valve surgery was planned despite the pandemic. The surgery was performed with general anaesthesia via a median sternotomy. The aorta was dilated and aneurysmatic. Subacute DeBakey type II AD of the ascending aorta with complete circular intimal tear was encountered with anatomical adhesions (Fig. 2 a).



**Fig. 1.** Preoperative CT angiography images at the level of the left coronary artery (a) and the ascending aorta (b)



**Fig. 2.** Circular aortic dissection which came across after aortotomy (a) and the view of completed modified Cabrol procedure (b)

The operation plan was subsequently changed to perform a modified Cabrol procedure. The left coronary artery was reconstructed using a 6 mm ringed graft, while the right coronary artery was prepared as a button. The ascending aorta and the dissection were resected. A 25 mm aortic prosthetic valve and a 30 mm Hemoshield graft were used for the proximal anastomosis and coronary implantation (modified Cabrol operation) (Fig. 2 b). Subsequently, a distal anastomosis was performed using the sandwich technique under aortic cross-clamp. No complications occurred during or after the surgery. The

patient was discharged uneventfully on the seventh postoperative day.

**Discussion.** AD is a rare disease with an estimated annual incidence of 3/100,000. It is more commonly observed in patients of advanced age, those with hypertension, aortic aneurysm, bicuspid aortic valve, smoking, syphilis, and connective tissue diseases such as Marfan syndrome and Ehlers-Danlos syndrome [4]. This case also had a bicuspid aortic valve and a 4 cm aortic aneurysm. In the context of routine clinical practice, it is uncommon to anticipate the dissection of aneurysms with

a diameter of approximately 4 cm. Nevertheless, a CT scan of the patient revealed no evidence of AD. Furthermore, in a study by Borger et al., patients who had aortic valve replacement surgery and those whose baseline aortic diameters were between 4.5 and 4.9 cm were found to have a considerably greater chance of aneurysm, dissection, or sudden death ( $p < 0.001$ ) than patients whose diameters were less than 4.5 cm [5]. However, this patient experienced an ascending AD with a circular tear of the intima.

During the global pandemic caused by the novel coronavirus (COVID-19), concerns about hygiene and the status of patients with the virus have led to the postponement of many non-urgent cases, including their treatments and evaluations. Consequently, cases that would have been considered critical, such as Stanford type A AD, have been overlooked, and some have progressed to a chronic stage, re-emerging at a later time.

A second imaging examination is advised when the first aortic imaging is negative but there is strong clinical possibility of acute AD. It is crucial to remember that the outcomes of merely one imaging study shouldn't be used to conclusively rule out acute AD. While magnetic resonance imaging, TEE and CT are all very precise for evaluating acute AD, false-negative results may occur [3]. One possible explanation for the false-negative CT and TEE results in our case is the presence of a circular tear in the intima, which may have prevented the flap from being visible. Furthermore, the relationship between COVID-19 and AD has been a topic of discussion since the pandemic due to the similarities in the pathological pathways involved. A recent review reported that AD may be a relatively rare but important complication in COVID-19 patients [6].

**Conclusions.** In this case, even if the intimal flap image had not been detected on the preoperative TEE and contrast-enhanced CT scan, and if the pandemic period had not occurred, the patient would have been operated on without delay due to severe aortic insufficiency. Although the operation was successful and the patient was discharged without complication, it is important to note that the risk of complications and mortality due to delayed subacute dissection is extremely high. In situations like the pandemic, it is crucial to thoroughly assess both elective and emergency cases. These operations should

be carried out expeditiously in well-equipped centres that maintain effective control of hygiene conditions. The implementation of appropriate precautions can significantly reduce mortality and morbidity rates, even in the context of a pandemic.

**Patient consent.** Obtained.

**Conflict of interest.** The authors have no conflict of interests to declare.

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## Випадкове виявлення підгострого розшарування аорти типу II за класифікацією DeBakey з круговим розривом інтими у пацієнта з тяжкою аортальною недостатністю під час пандемії COVID-19

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**Резюме.** Представлено випадок тяжкої аортальної недостатності, виявленої в період пандемії, коли операцію було відкладено з гігієнічних міркувань та через підозру на COVID-19. Через 1 місяць скарги пацієнта погіршилися. Повторні передопераційні дослідження показали відсутність змін та ознак розшарування. Підозру на COVID-19 було виключено, тому, незважаючи на пандемію, проведено термінову операцію на аортальному клапані. Під час операції неочікувано виявлено підгостре розшарування аорти типу II за класифікацією DeBakey з повним круговим розривом інтими. Успішно виконано модифіковану операцію за Cabrol. Розшарування аорти іноді залишається невиявленим, і частота таких випадків може збільшуватися під час стихійних лих, зокрема пандемії та землетрусу.

**Ключові слова:** розшаровуюча аневризма аорти, SARS-CoV-2, двостулковий аортальний клапан, недостатність аортального клапана, аневризма аорти, клінічний випадок.

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