



Anomalous origin of the right coronary artery – TAVI or no TAVI?

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Objective

Transcatheter aortic valve implantation (TAVI) has become a routinely used therapy option in a selected patient population at high risk for conventional surgery. Different anatomically variants require a careful evaluation and planning of the procedure. Therefore, we are reporting a case study of a TAVI procedure with an anomalous origin of the right coronary artery.

Patient history

A 77-year-old man diagnosed with a severe symptomatic aortic stenosis and worsening dyspnea during exertion was referred to our heart team. The preprocedural computed tomography revealed an anomalous origin of the right coronary artery from the left coronary sinus (ARCA). The proximal part of the RCA showed an intramural course between the aorta and the pulmonary truncus. It was decided that the amount of calcification in the left cusp was moderate and a compression of the intramural right coronary artery through the expansion of the transcatheter valve is unlikely.

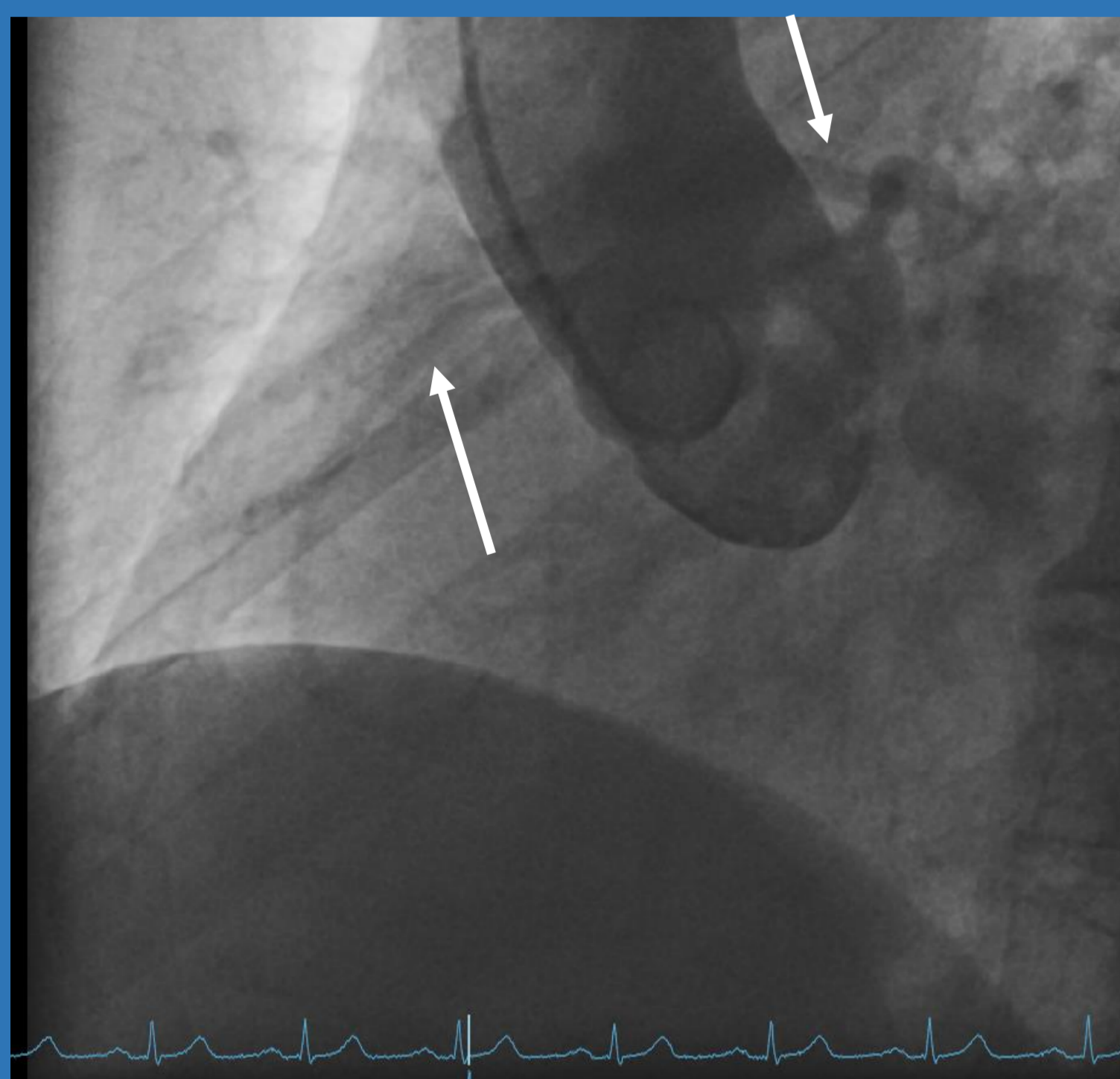


Figure 1:
In the preoperative coronary angiography, a selective presentation of the right coronary artery (RCA) was not possible. The white arrows are marking the RCA with its origin in the left coronary sinus

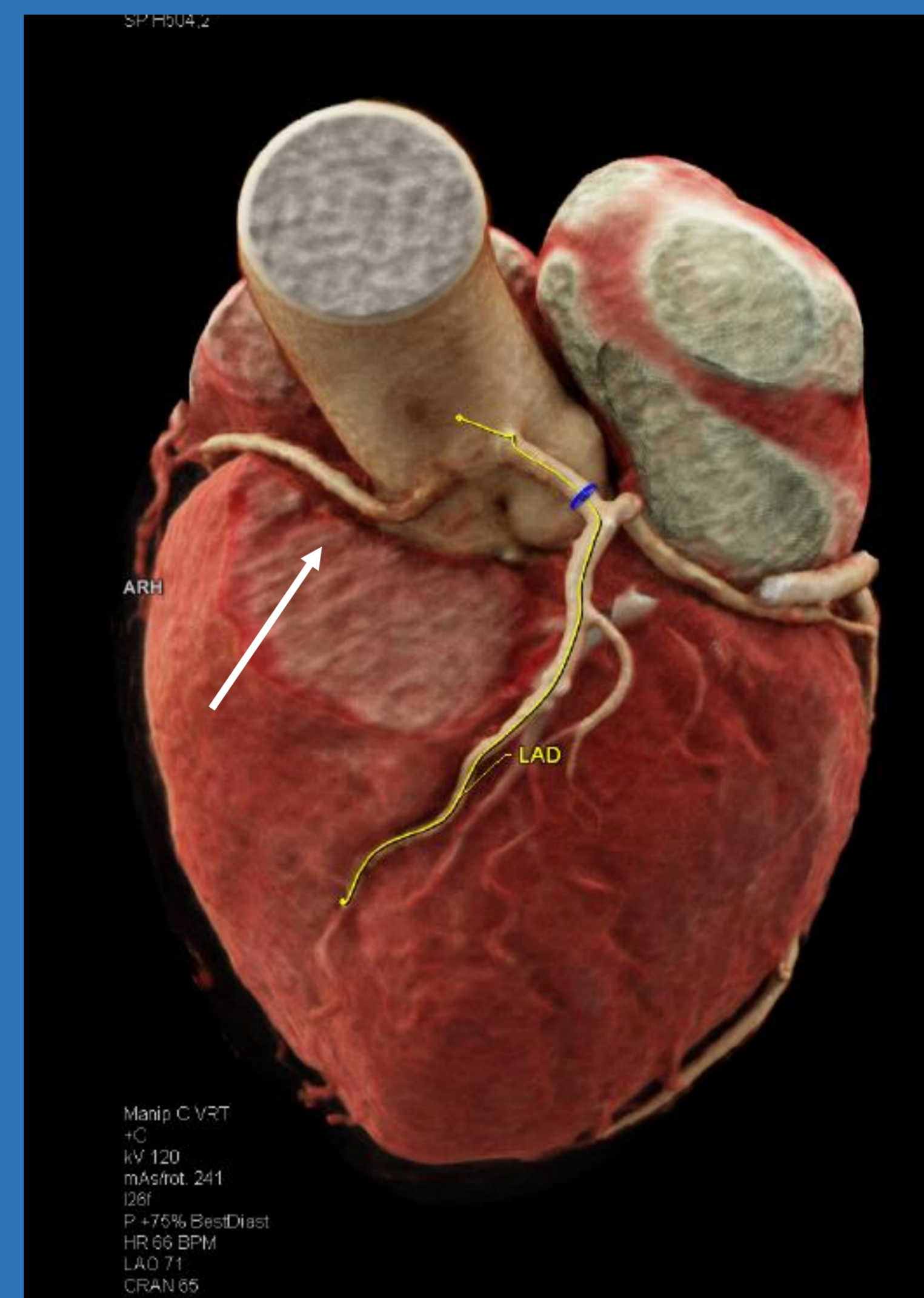


Figure 2:
The 3D reconstruction of the computed tomography is showing the origin and course of the right coronary artery. The white arrow is marking the RCA.

Operation

The heart team performed a transfemoral TAVI under general anesthesia. A balloon-expandable valve was implanted using the standard delivery system through the right femoral artery. The implantation was without any complications. Injection of contrast agent in the aortic root showed filling of both coronary arteries. Ten minutes after implantation, the patient became hemodynamically unstable. Transesophageal echocardiography revealed a decrease in right ventricular function. Electrocardiogram remained without any ST-elevation or depression. Nevertheless, the heart team decided to perform an aortocoronary bypass on the right coronary artery using a vena saphena magna graft. Weaning from cardiopulmonary bypass was uncomplicated and right ventricular function recovered quickly.

Perioperative course

After a short intensive care unit stay, the patient was transferred to the normal ward and could be discharged to the referring hospital on the 7th postoperative day. Unfortunately, the patient died suddenly on the 15th postoperative day. Post-mortem examination revealed a serous pericardial effusion as the only pathological finding.

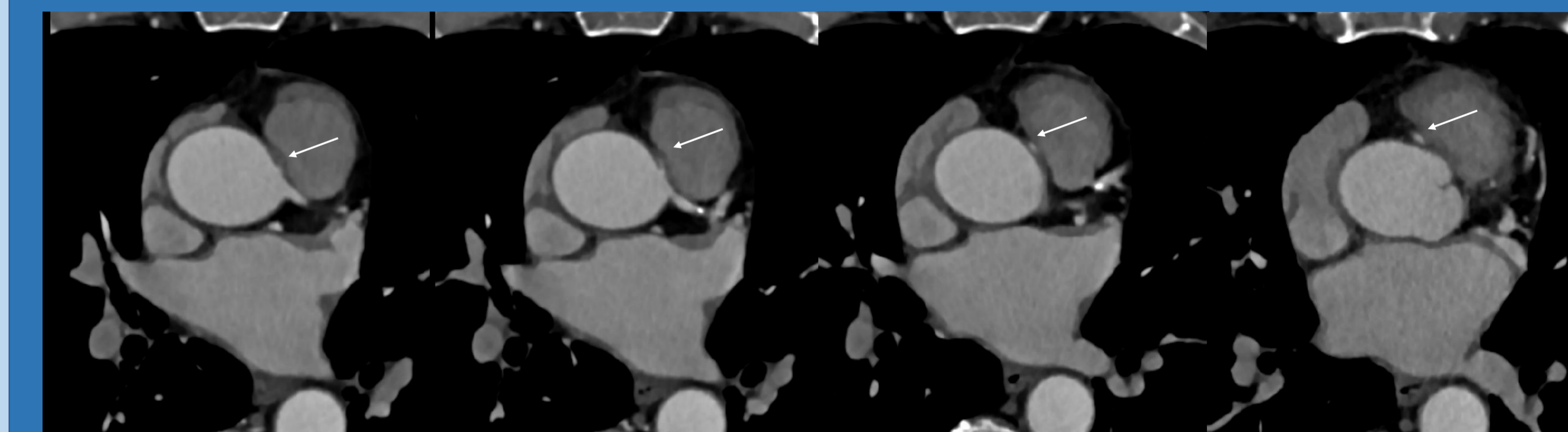


Figure 3:
The preoperative computed tomography revealed the origin of the right coronary artery in the left coronary sinus. The proximal part of the RCA showed an intramural course between aorta and pulmonary truncus. The white arrows are marking the RCA.

Conclusion

Anomalous origin of the right coronary artery with an intramural course is a challenging indication for TAVI. In our case we could observe severe ischemia after implantation and immediate intervention was necessary.