the CT scan revealed the ectopic ostium of the circumflex artery in the right coronary sinus separated from the right coronary artery and in close relation to the commissure between the right- and non-coronary sinus. Starting from there, the circumflex artery took a long dorsal run crossing the annular level.

CASE DESCRIPTION

A 45-year old male patient suffered from progressive dyspnoea resulting from aortic valve insufficiency. Owing to an aortic root aneurysm of 5.6 cm, he was scheduled for elective root repair. The patient had a tricuspid aortic valve with thin and non-calcified cusps. Echocardiography revealed severe central aortic regurgitation due to a cusp coaptation defect secondary to aortic root aneurysm. In the preoperative coronary angiography, it was hardly possible to visualize the large circumflex artery arising from the right coronary sinus. The right coronary artery was very small. No signs of coronary artery disease were found (Fig. 1). Coronary computed tomography confirmed a circumflex artery with a separate ectopic ostium in the right coronary sinus (Fig. 2). The circumflex artery originated from the right coronary sinus in close proximity to the commissure between the non- and the right coronary sinus. The dorsal run around the annulus between the aortic root and the left atrial roof led the artery to the oblique sinus where the normal contribution to the perfusion of the lateral and inferior wall was maintained.

The initial plan for classical valve-sparing root repair was questioned because of the need of extensive skeletonization of the aortic root with possible harm to the artery. Also, prosthetic valve and root replacement (Bentall procedure) with reimplantation of all three ostia is a possibly dangerous procedure in the setting of a coronary artery crossing the dorsal aspect of the annulus with probable distortion of the artery during suture and prosthesis placement.

Conflict of interest: none declared.

REFERENCES


Treatment solution by Siepe et al.

Treatment of choice for the detection of abnormal circumflex artery from the right coronary sinus in a patient scheduled for root aneurysm repair

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Our surgical plan for the presented challenging case was a valve-sparing [1]. Whenever a preparation of the vessel is impossible or the vessel is damaged, we decide upon proximal closure of the vessel and bypass grafting plus prosthetic root replacement.

We have intraoperatively achieved to prepare a very long segment of the circumflex including the artery’s part crossing the annulus. Approximately 8 cm of the vessel were released from adhesions until it entered the oblique sinus and vanished in the left atrioventricular groove just before the base of the left atrial appendage. This long mobilization seemed necessary to prohibit later kinking during reimplantation. With the abnormal artery secured, we were able to proceed with skeletonization of the root and valve-sparing root replacement (David I) (Fig. 1). A straight 34-mm Dacron tube graft was used and the valve reimplanted in a usual fashion. The left anterior descending artery and the right coronary artery were reimplanted in a classical fashion. For reimplantation of the circumflex artery, we chose a long sling run across the tube graft ending at the right lateral and distal part of the prosthesis (Fig. 2). The direct postoperative TEE revealed a competent valve and normal left ventricular (LV) function. The postoperative course was uneventful. At 3 months postoperatively, the patient is in a healthy condition; echocardiography revealed normal LV function without aortic valve insufficiency, and the coronary CT highlights good function of the reimplanted ectopic circumflex artery.

Conflict of interest: none declared.
The left internal thoracic artery to bypass an abnormal circumflex artery arising from the right coronary sinus in a patient scheduled for root aneurysm repair. 

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Although classic valve-sparing root repair yields excellent results (survival at 10 years of 93.5%, freedom from structural valve deterioration at 10 years of 96.1% [1]), I agree with Siepe and colleagues [2] that extensive skeletonization of the aortic root might jeopardize an abnormal circumflex artery arising from the right coronary sinus and crossing the dorsal aspect of the annulus. I also agree with the authors’ suggestion that prosthetic valve and root replacement (Bentall procedure) with reimplantation of all three ostia is a possibly dangerous procedure due to potential distortion of the circumflex artery during suture and prosthesis placement. On the other hand, the left internal thoracic artery (LITA) graft has excellent long-term patency when grafted to the circumflex coronary artery (almost 90% at 10 years [3]). Therefore, in my opinion, the ostium of the abnormal circumflex artery should be oversewn, and the in situ LITA graft (skeltonized or pedicled) should be used to bypass the circumflex artery (if possible, the circumflex artery should also be ligated and oversewn proximal to the anastomotic site). The oversewing of an abnormal circumflex coronary artery ostium originating from the right coronary sinus in close proximity to the commissure between the non- and the right coronary sinus could jeopardize annular geometry and outcome of valve sparing root repair procedure. Therefore, my final choice would be to perform prosthetic valve and root replacement (Bentall ‘button’ procedure) with reimplantation of the right and left coronary ostia. The ostium of the abnormal circumflex artery should be oversewn, and the LITA conduit should be used to graft the circumflex coronary artery. This approach can make the whole procedure very safe and simple.

Conflict of interest: none declared.

References


Aortic-root aneurysm repair: how to deal with an abnormal circumflex artery from the right coronary sinus

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I read with great interest the clinical scenario by Siepe et al. about the detection of abnormal circumflex artery from the right coronary sinus in a patient scheduled for root aneurysm repair [1]. Aortic-valve sparing operations is a safe and useful surgical operation for treating patients with aortic root aneurysms and ascending aorta aneurysms with dilated aortic sinuses. The long-term results are excellent [2]. Our treatment plan would be the following: in this patient with an aortic root aneurysm, as we decide that the native cusps are normal, the ascending aorta and the sinuses of Valsalva are excised, leaving a rim of 5 mm above the aortic annulus. The right coronary artery button is left in situ. The circumflex artery button, which is in close proximity to the commissure between the non- and the right coronary sinus is also left in situ (the right coronary sinus is left in situ containing both ostia, it is a composite button). The left anterior descending artery button which is not displaced is prepared as normal. A suitable Dacron graft is then selected and a vertical slit of 2 to 3 mm is made in its proximal end so as to accommodate the in situ coronary sinus with both ostia. The Dacron graft is tied down to the subannular plane. The slit in the Dacron graft is trimmed to create an orifice to house the in situ coronary sinus. The coronary arteries are checked to see if there is kinking or compression by the Dacron. The right aortic sinus with both ostia is then sutured to the Dacron graft by continuing the polypropylene suture that will be used to re-suspend the adjacent commissure. The upper and the lateral border of this sinus with both ostia is sutured first and when reaching the lower border, the remaining aortic annulus and sinus remnants are re-suspended in the usual way. The other coronary button is re-implanted as normal. The rest of the operation is performed as usual [3].

Conflict of interest: none declared.

References
