

Anomalous coronary artery from the pulmonary artery diagnosed in adulthood: a case series on variations of coronary anatomy and the diagnostic value of cardiac magnetic resonance imaging

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Background

Anomalous coronary artery from the pulmonary artery is a rare congenital disorder with high mortality rates in infancy. Adult cases can present with life-threatening arrhythmias and sudden cardiac death.

Case summary

We report three cases of adults with anomalous pulmonary origin of each of the main coronary branches. The first patient with an anomalous left coronary artery from the pulmonary artery presented with an out-of-hospital cardiac arrest. The second patient with an anomalous circumflex artery from the pulmonary artery was evaluated for a bicuspid aortic valve and a suspected coronary fistula but was otherwise asymptomatic. The third patient with an anomalous right coronary artery from the pulmonary artery presented with anginal symptoms. In all cases, the diagnosis was made by cardiac computed tomography or coronary angiography. Cardiac magnetic resonance imaging was performed in all patients to guide clinical decision making on surgical or non-invasive management. All patients underwent surgical repair. In two patients, a dual coronary artery system was restored by aortic reimplantation of the anomalous coronary artery. In one patient, aortic reimplantation was unsuccessful due to poor vessel quality and the anomalous coronary artery was ligated. Clinical follow-up during 1.8–9.7 years did not show any cardiovascular complications and all patients are currently alive and asymptomatic.

Discussion

Anomalous coronary artery from the pulmonary artery can have various clinical presentations in adulthood. Cardiac magnetic resonance imaging is a useful modality to guide selection of patients who might have symptomatic or prognostic benefit from surgical repair.

Keywords

ALCAPA • Bland–White–Garland syndrome • Magnetic resonance imaging • Adult • Case series

ESC Curriculum

2.1 Imaging modalities • 2.3 Cardiac magnetic resonance • 9.7 Adult congenital heart disease

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Learning points

- Anomalous coronary artery from the pulmonary artery is a rare cause of life-threatening arrhythmias and sudden cardiac death in adults.
- Current guidelines recommend surgical repair for patients with anomalous left coronary from the pulmonary artery.
- Cardiac magnetic resonance imaging is an important diagnostic modality, which can be used for the appropriate selection of patients for surgery.

Introduction

Anomalous coronary artery from the pulmonary artery (ACAPA) is a rare coronary anomaly which affects 1 of every 300 000 live births.¹ Clinical presentation in infancy is usually characterized by myocardial ischaemia, heart failure, and secondary mitral regurgitation, which has been associated with a 90% mortality during the first year of life.^{2,3} Anomalous coronary artery from the pulmonary artery prevalence in adulthood is rare but probably underreported since patients may be (nearly) asymptomatic. A systematic review identified a total of 151 adult ACAPA patients in a period from 1908 to 2008. Mean age at diagnosis was 41 years and two-thirds of patients were female. Sixty-eight percent of patients had subacute symptoms, 14% of patients were asymptomatic, and 18% patients had a life-threatening clinical presentation without previous symptoms in the majority of cases.⁴

Timeline

Patient 1: Male, 25 years

- June 2018 Out-of-hospital cardiac arrest due to ventricular fibrillation
Cardiac computed tomography (CT): Anomalous left coronary from the pulmonary artery (ALCAPA)
Cardiac magnetic resonance imaging (CMR): Extensive ischaemia in myocardial territory perfused by the left coronary artery (LCA), no signs of myocardial fibrosis
Surgery: LCA reimplantation in the ascending aorta, reconstruction of the main pulmonary artery with a pericardial patch and a Contegra conduit
- July 2018 Subcutaneous implantable cardiac defibrillator (ICD) implantation for secondary prevention
- April 2020 Outpatient visit: Asymptomatic. Echocardiography: Normal systolic and valvular function. Implantable cardiac defibrillator interrogation: No arrhythmia

Patient 2: Male, 24 years

- 2005 Evaluation by paediatric cardiologist due to a bicuspid aortic valve and a suspected coronary fistula
- October 2012 Transition to adult cardiologist: Asymptomatic patient with a continuous cardiac murmur at the left sternal border
Echocardiography: Turbulent colour Doppler flow signals in the right ventricular free wall
Cardiac CT: Anomalous circumflex from the pulmonary artery (ACxPA)
Cardiac magnetic resonance imaging: Subendocardial perfusion defect in the inferolateral wall. No signs of myocardial fibrosis

Continued

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- April 2013 Surgery: Ligation of ACxPA after unsuccessful reimplantation
- March 2014 Cardiac magnetic resonance imaging: Minor subendocardial infarction of the basal inferolateral wall
- May 2020 Outpatient visit: Asymptomatic patient
- Patient 3: Female, 63 years
- July 2010 Outpatient clinic: Anginal complaints. Dobutamine stress CMR: Positive for myocardial ischaemia
- October 2011 Coronary angiography: Extensive collateral network of vessels from the left coronary artery to the right coronary artery (RCA). Significant stenosis in the ramus intermedius
Cardiac CT: Anomalous right coronary from the pulmonary artery (ARCAPA)
- November 2011 Surgery: RCA reimplantation and coronary artery bypass grafting of the ramus intermedius with a left internal mammary artery
Re-operation due to clinical suspicion of cardiac tamponade
- November 2014 Cardiac magnetic resonance imaging: No signs of myocardial fibrosis
- October 2020 Successful percutaneous coronary intervention of chronic total occlusions of the left anterior descending and circumflex coronary artery
- March 2021 Outpatient visit: Asymptomatic patient

Several variations of ACAPA have been classified as part of the Society for Thoracic Surgeons Congenital Heart Surgery Nomenclature and Database Project⁵:

- (1) ALCAPA
- (2) ARCAPA
- (3) ACxPA
- (4) Anomalous left and right coronaries from the pulmonary artery (both ALCAPA and ARCAPA)

We present a case series of three adult patients with ACAPA. A short review of the literature is given and the role of CMR for the comprehensive evaluation of ACAPA patients is highlighted.

Case presentations

Patient 1: Anomalous left coronary from the pulmonary artery

A 25-year-old male was admitted after an out-of-hospital cardiac arrest due to ventricular fibrillation. His medical history was unremarkable. Family history identified a father with dilated cardiomyopathy and a

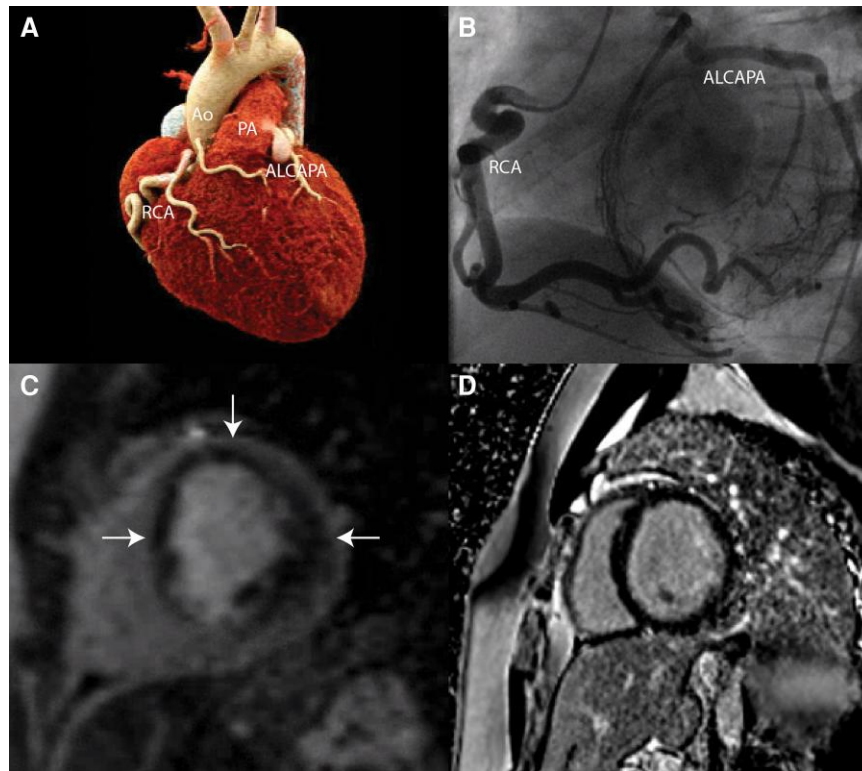


Figure 1 (A) Volume rendered cardiac computed tomography reconstruction of the left coronary artery originating from the main pulmonary artery. (B) Coronary angiography showing a large dominant right coronary artery with an extensive collateral network including a prominent septal branch providing retrograde perfusion of the anomalous left coronary artery from the pulmonary artery. (C) Adenosine perfusion cardiac magnetic resonance imaging revealing a perfusion deficit at the midventricular level of the septal, anterior, and lateral wall (indicated with white arrows). (D) Late gadolinium enhancement showing the absence of myocardial fibrosis. Ao, aorta; PA, pulmonary artery; RCA, right coronary artery.

life-threatening arrhythmia requiring an ICD. Physical examination was normal. Electrocardiogram showed sinus rhythm with increased QRS duration (122 ms). After ICU admission clinical recovery was rapid. Transthoracic echocardiography showed normal systolic and valvular function. Coronary angiography demonstrated dominant RCA ectasia with an extensive collateral network including a prominent septal branch extending to the LCA. The origin of the LCA was not identified. Cardiac CT revealed the LCA originating from the main pulmonary artery (ALCAPA) (Figure 1A and B). Adenosine stress CMR demonstrated extensive ischaemia in multiple segments perfused by the LCA but no late gadolinium enhancement (Figure 1C and D). The patient underwent cardiac surgery in which the LCA was reimplanted in the aorta and the base of the main pulmonary artery was reconstructed with a pericardial patch and a Contegra conduit. Despite the removal of the (apparent reversible) cause of ventricular fibrillation, a subcutaneous ICD was implanted for secondary prevention. This decision was based on the life-threatening nature of the rhythm disorder, our reluctance to apply general guidelines for this rare condition, and the family history of life-threatening arrhythmia (father). Two years after his cardiac arrest, the patient was asymptomatic at his last outpatient visit. Echocardiography showed normal systolic function and ICD interrogation did not demonstrate arrhythmia.

Patient 2: Anomalous circumflex from the pulmonary artery

A 24-year-old male was evaluated at the outpatient clinic. As a teenager, he had been evaluated by a paediatric cardiologist due to a bicuspid aortic valve

and a suspected coronary fistula. The patient was asymptomatic. At physical examination, a loud continuous cardiac murmur was heard at the left sternal border. Electrocardiogram showed a sinus rhythm of 69 b.p.m. with a right bundle branch block and left atrial enlargement. Transthoracic echocardiography showed turbulent colour Doppler flow signals in the right ventricular free wall. Cardiac CT revealed anomalous origin of a dominant circumflex artery from the right pulmonary artery (ACxPA) (Figure 2A). Furthermore, azygos continuation of the inferior vena cava and a ventricular septal defect were found. Coronary angiography demonstrated an extensive collateral network to the anomalous circumflex artery from the RCA (Figure 2B). Adenosine stress CMR showed a subendocardial perfusion defect in the inferolateral wall without myocardial fibrosis on late gadolinium enhancement (LGE) imaging (Figure 2C and E) after which surgical repair was advised due to the presence of myocardial ischaemia. However, reimplantation was unsuccessful due to poor vessel quality and the circumflex artery was ligated. After a swift post-operative recovery, the patient was discharged. A post-operative CMR showed a more pronounced perfusion deficit in the inferolateral wall and a subtle subendocardial infarction of the basal inferolateral wall (Figure 2D and F). It was hypothesized that these CMR findings were related to insufficiency of the existing collateral vessels after ligation of ACxPA. Nevertheless, the patient has remained asymptomatic 8 years after surgery.

Patient 3: Anomalous right coronary from the pulmonary artery

A 63-year-old female with a medical history of hypertension presented to the outpatient clinic with exertional chest pain. On physical

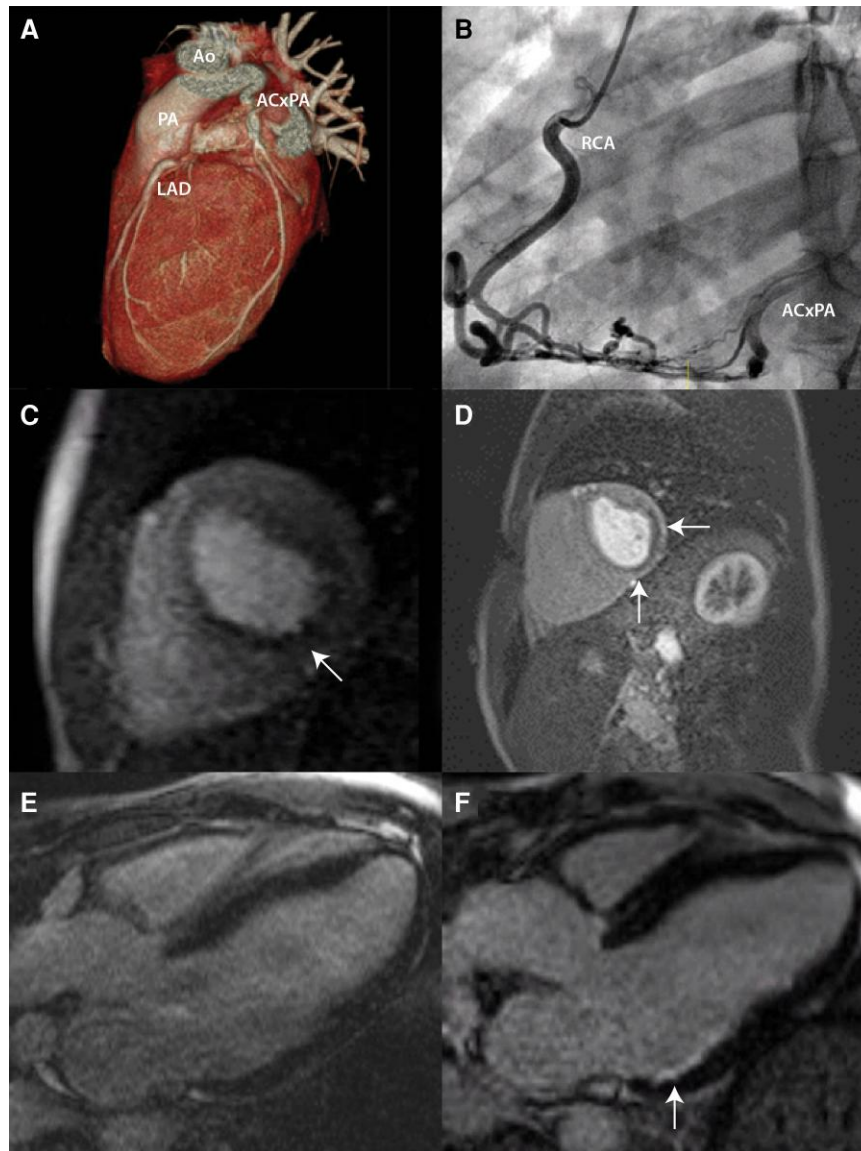


Figure 2 (A) Cardiac computed tomography reconstruction of the circumflex coronary artery originating from the right pulmonary artery. (B) Coronary angiography showing collateral vessels from the right coronary artery to the anomalous circumflex artery from the pulmonary artery. (C) Adenosine perfusion cardiac magnetic resonance imaging showing a subendocardial perfusion deficit of the basal inferolateral wall (indicated with a white arrow). (D) Cardiac magnetic resonance imaging after ligation of anomalous circumflex artery from the pulmonary artery showing a more pronounced perfusion deficit of the basal inferolateral wall (indicated with a white arrow). (E) Preoperative cardiac magnetic resonance imaging showing no signs of myocardial fibrosis on late gadolinium enhancement imaging. (F) After ligation of anomalous circumflex artery from the pulmonary artery, a small subendocardial infarction of the basal inferolateral wall was observed (indicated with a white arrow). Ao, aorta; PA, pulmonary artery; RCA, right coronary artery; LAD, left anterior descending artery.

examination, her blood pressure was 138/77 mmHg and cardiac auscultation was normal. Electrocardiogram showed sinus rhythm 69 b.p.m. Adenosine stress CMR showed an inferior subendocardial perfusion defect without myocardial fibrosis (*Figure 3C and D*). Subsequent coronary angiography demonstrated a significant stenosis in the ramus intermedius and an extensive collateral network of vessels from the LCA to the RCA (*Figure 3B*). The origin of the RCA was not found. Cardiac CT demonstrated an anomalous and dominant RCA, which originated from the pulmonary artery (*Figure 3A*). Echocardiography demonstrated normal systolic and valvular function. The patient underwent a

combined procedure of RCA reimplantation and coronary artery bypass surgery with grafting of the ramus intermedius using a left internal mammary artery. Re-operation was performed for clinically suspected cardiac tamponade; however, this was not confirmed at inspection. Hereafter, the post-operative recovery was uncomplicated. A perfusion CMR 3 years after surgery showed no signs of ischaemia or myocardial fibrosis.

She remained asymptomatic for 10 years after surgery. One year ago, she developed recurrent anginal complaints for which percutaneous coronary intervention of the LAD and RCx was performed.

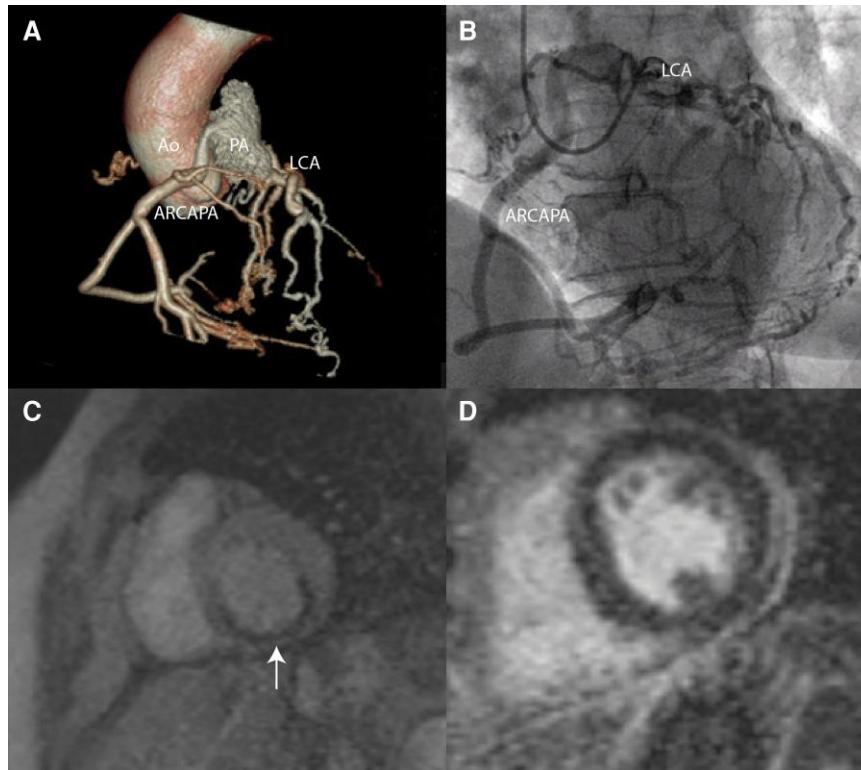


Figure 3 (A) Cardiac computed tomography reconstruction of the right coronary artery originating from the main pulmonary artery. (B) Coronary angiography showed extensive collateral vessels from the left coronary artery to the anomalous right coronary artery from the pulmonary artery. (C) An inferior subendocardial perfusion deficit at the midventricular level was observed on adenosine perfusion cardiac magnetic resonance imaging (indicated with a white arrow). (D) Cardiac magnetic resonance imaging showing the absence of myocardial fibrosis at the midventricular level on late gadolinium enhancement imaging. Ao, aorta; PA, pulmonary artery; LCA, left coronary artery.

Discussion

Pathophysiology of ACAPA is determined by hypoxia and hypoperfusion. Immediately after birth, the anomalous coronary artery is perfused with desaturated blood from the pulmonary artery. In the first days to weeks after birth, pulmonary artery pressure and vascular resistance gradually fall. Together with closure of the ductus arteriosus, this results in decreased oxygen content and inadequate perfusion pressure of the anomalous coronary artery.⁶ Outcome is strongly related to the development of collateral vessels carrying oxygen-saturated blood to the low-pressure ACAPA. Insufficient collateralization may result in ischaemia and infant death. Patients who develop sufficient collateralization can survive after childhood but myocardial ischaemia may occur when myocardial perfusion is compromised by reversal of flow to the low-pressure pulmonary artery, producing a coronary steal effect, or in case of stenosis of normal coronary arteries or the collateral vessels. Clinical presentations in these adult ACAPA patients include ventricular arrhythmias, sudden cardiac death, heart failure, and ischaemic mitral regurgitation. Asymptomatic adult ACAPA patients generally have extensive collateralization, which maintains adequate myocardial perfusion despite a steal phenomenon.^{1,6,7}

Optimal treatment of this rare coronary anomaly is subject of debate. Surgical repair was performed in 102 of 120 adult ALCAPA patients (85%) between 1908 and 2008 with a reported operative mortality of 1–4%. The average age of life-threatening presentations

(ventricular arrhythmia or syncope) was 33 years, whereas the average age of sudden death was 31 years. Interestingly, a lower risk of sudden cardiac death was found in older patients (total mortality of 9% <50 years vs. 2% >50 years) despite the fact that 37% of patients above 50 years were not operated.⁴ This finding could be explained by the fact that ACAPA patients who have survived beyond 50 years probably have more extensive collateralization and hence less ischaemia-induced ventricular arrhythmia. Due to the increased sudden cardiac death risk dual coronary system repair is recommended by ESC guidelines in all adult ALCAPA patients including ACxPA.⁸ Whether sudden cardiac death risk differs between ALCAPA, ACxPA, or ARCAPA is not reported in the literature.

In case of ARCAPA, dominance of the RCA needs to be established. A non-dominant ARCAPA will generally not lead to clinically significant myocardial ischaemia due to lower oxygen demand of the right ventricle compared with the left ventricle.⁹ Surgery should only be considered in case of symptoms attributable to ARCAPA or in asymptomatic patients with evidence of left ventricular systolic dysfunction or myocardial ischaemia.⁸ Anomalous left coronary artery from the pulmonary artery patients with a non-dominant RCA as a rule do not survive beyond infancy, illustrated by the fact that only one adult ALCAPA patient with a left dominant coronary circulation has been reported.¹⁰

In any case, symptomatic and prognostic benefit should outweigh surgical risk in adult ACAPA patients with no or limited symptoms.

Traditionally, coronary anatomy of ACAPA patients is visualized by invasive coronary angiography. Technical advances in CT coronary angiography currently enable high resolution non-invasive depiction of coronary anatomy with low radiation and contrast dose. Although CT is considered the first line imaging modality for assessment of anomalous coronary anatomy, CMR is a powerful additional modality that provides a comprehensive evaluation of ACAPA, which can be used for the appropriate selection of patients for surgery. Cardiac magnetic resonance imaging is considered the gold standard of assessment and quantification of ventricular size and function.¹¹ Furthermore, phase-contrast CMR and 3D whole-heart MR angiography allow for evaluation of the heart valves and coronary anatomy respectively. Stress CMR and LGE imaging are the most important utilities of CMR in the evaluation of ACAPA patients, both of which are discussed in detail below.

Stress cardiac magnetic resonance imaging

Due to the scarcity of data, the optimal method of evaluating myocardial ischaemia is unknown. Dobutamine stress testing might be the appropriate method of ischaemia detection in ACAPA patients in whom ischaemia is elicited by a combination of coronary steal and inadequate collateral flow in face of an increased myocardial oxygen demand.¹² Indeed, dobutamine stress CMR has been able to demonstrate stress-induced wall motion abnormalities and perfusion deficits in areas supplied by the ACAPA.¹³ However, myocardial ischaemia has also been demonstrated in ACAPA using adenosine first-pass perfusion CMR^{10,13} and in all patients of this case series. By identifying the number of ischaemic myocardial segments, stress CMR can help stratify patients at highest risk of ventricular tachyarrhythmias and sudden cardiac death, although no literature exists on extent of myocardial ischaemia and its correlation with sudden cardiac death. In our institution, the decision to perform surgical repair is taken with consideration of the presence of ischaemia without accounting for the number of ischaemic myocardial segments.

Late gadolinium enhancement

Despite collateralization in adult ACAPA patients, chronic ischaemia can lead to myocardial scarring. Late gadolinium enhancement is a robust method to visualize scarring in the myocardial territory perfused by the ACAPA. In a case series of 14 ALCAPA patients with surgical repair beyond infancy, 10 patients had evidence of myocardial scarring with ischaemic patterns (subendocardial, transmural or diffuse LGE), albeit the extent of myocardial scarring was limited (median 2% of total left ventricular mass).¹⁴ Myocardial scarring is a potential arrhythmogenic substrate for ventricular tachyarrhythmias or sudden cardiac death and as such, CMR can identify patients who might benefit from ICD implantation.¹⁵

Conclusion

Anomalous coronary artery from the pulmonary artery has a high mortality in infancy but may present in late adulthood if extensive collateral vessels are present. Clinical presentation varies from asymptomatic cases to life-threatening arrhythmias. Restoration of a dual coronary artery system is generally the surgical treatment of choice. However, non-invasive management should be considered, especially in older patients (>50 years) without evidence of myocardial ischaemia. Advances in cardiac imaging allow non-invasive evaluation of ACAPA patients. Cardiac magnetic resonance imaging provides comprehensive evaluation of ACAPA, which can be used to select patients who might have symptomatic or prognostic benefit from surgical repair. Although prospective studies are lacking, this case series

indicates that adenosine stress CMR is useful for ischaemia detection in ACAPA patients.

Lead author biography



Dr Mehrdad Talebian Yazdi was trained as a cardiologist at the Haga Teaching Hospital in the Netherlands. He obtained a PhD in 2017 and currently he is working at the Alrijne Hospital in the Netherlands as a cardiologist specialized in cardiac imaging and heart failure.

Supplementary material

Supplementary material is available at *European Heart Journal—Case Reports* online.

Slide sets: A fully edited slide set detailing this case and suitable for local presentation is available online as Supplementary data.

Consent: The authors confirm that written consent for submission of the case series including images and associated text has been obtained from all patients in line with COPE guidance.

Conflict of interest: None declared.

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References

1. Lange R, Cleuziou J, Krane M, Ewert P, von Ohain J P, Beran E, Vitanova K. Long-term outcome after anomalous left coronary artery from the pulmonary artery repair: a 40-year single-centre experience. *Eur J Cardiothorac Surg* 2018;**53**:732–739.
2. Agustsson MH, Gasul BM, Fell EH, Graettinger JS, Bicoff JP, Waterman DF. Anomalous origin of left coronary artery from pulmonary artery. *JAMA* 1962;**180**:15–21.
3. Keith JD. The anomalous origin of the left coronary artery from the pulmonary artery. *Br Heart J* 1959;**21**:149–161.
4. Yau JM, Singh R, Halpern EJ, Fischman D. Anomalous origin of the left coronary artery from the pulmonary artery in adults: a comprehensive review of 151 adult cases and a new diagnosis in a 53-year-old woman. *Clin Cardiol* 2011;**34**:204–210.
5. Dodge-Khatami A, Mavroudis C, Backer CL. Congenital heart surgery nomenclature and database project: anomalies of the coronary arteries. *Ann Thorac Surg* 2000;**69**:01248–5.
6. Beasley GS, Stephens EH, Backer CL, Joong A. Anomalous left coronary artery from the pulmonary artery (ALCAPA): a systematic review and historical perspective. *Curr Pediatr Rep* 2019;**7**:45–52.
7. Boutsikou M, Shore D, Li W, Rubens M, Pijuan A, Gatzoulis MA, Babu-Narayan SV. Anomalous left coronary artery from the pulmonary artery (ALCAPA) diagnosed in adulthood: varied clinical presentation, therapeutic approach and outcome. *Int J Cardiol* 2018;**261**:49–53.
8. Baumgartner H, De Backer J, Babu-Narayan SV, Budts W, Chessa M, Diller GP, Lung B, Kluijn J, Lang IM, Meijboom F, Moons P, Mulder BJM, Oechslin E, Roos-Hesselink JW, Schwerzmann M, Sondergaard L, Zeppenfeld K. 2020 ESC Guidelines for the management of adult congenital heart disease. *Eur Heart J* 2021;**42**:563–645.
9. Williams IA, Gersony WM, Hellenbrand WE. Anomalous right coronary artery arising from the pulmonary artery: a report of 7 cases and a review of the literature. *Am Heart J* 2006;**152**:023.
10. Ripley DP, Gosling OE, Harries S, Spurrell PA, Bellenger NG. Multimodality imaging in Bland–White–Garland syndrome in an adult with a left dominant coronary artery system. *Congenit Heart Dis* 2014;**9**:22.
11. Kawel-Boehm N, Hetzel SJ, Ambale-Venkatesh B, Captur G, Francois CJ, Jerosch-Herold M, Salerno M, Teague SD, Valsangiacomo-Buechel E, van der Geest RJ, Bluemke DA. Reference ranges (“normal values”) for cardiovascular magnetic resonance (CMR) in adults and children: 2020 update. *J Cardiovasc Magn Reson* 2020;**22**:87.

12. Elhendy A, Zoet Nugteren S, Cornel JH, Fioretti PM, Bogers AJ, Roelandt JR, Krenning E, Postma-Tjoa J, McGhie J, Spitaels SE. Functional assessment of ALCAPA syndrome by dobutamine stress thallium-201 SPECT and echocardiography. *J Nucl Med* 1996;**37**:748–751.
13. Komócsi A, Simor T, Tóth L, Szabados S, Mágel F, Pintér T, Aradi D, Kónyi A, G Horváth I, Papp L. Magnetic resonance studies in management of adult cases with Bland–White–Garland syndrome. *Int J Cardiol* 2007;**123**:e8–e11.
14. Sauer U, Stern H, Meisner H, Bühlmeier K, Sebening F. Risk factors for perioperative mortality in children with anomalous origin of the left coronary artery from the pulmonary artery. *J Thorac Cardiovasc Surg* 1992;**104**:696–705.
15. Regeer MV, Bondarenko O, Zeppenfeld K, Egorova AD. Anomalous left coronary artery from the pulmonary artery: a rare cause of an out-of-hospital cardiac arrest in an adult—a case report. *Eur Heart J Case Rep* 2020;**4**:1–5.