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ARRHYTHMIC COMPLICATIONS AFTER COVID-19 PNEUMONIA IN A LIVER TRANSPLANT PATIENT

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Introduction

COVID-19 may cause ventricular dysfunction as a complication, ranging from mild disease to fulminant myocarditis, which can predispose to malignant arrhythmias. In a liver transplant patient with immunosuppressive treatment, there are particular challenges concerning the diagnosis and treatment.

Case presentation

We are presenting the case of a 52 year old patient, with a history of liver transplant for toxic hepatic cirrhosis in 2019 and recent (3 months prior) COVID-19 pneumonia, admitted in the cardiology clinic for dyspnea at rest, palpitations and fatigue occuring in the last month. His medical records showed normal cardiac function on repeated assessments before and after surgery. Physical examination revealed a haemodinamically stable patient, with normal blood pressure values, rhythmic heart sounds, a grade III/VI systolic murmur in the mitral area and pulmonary rales. The ECG showed sinus rhythm 75b/min and left ventricular hypertrophy. The echocardiography revealed dilated left ventricle with severe systolic dysfunction (ejection fraction 20%) and spontaneous echocardiographic contrast. Laboratory work-up indicated increased levels of NT-proBNP. The history of palpitations associated with the echocardiographic aspect of dilated cardiomyopathy, required 24-hour Holter ECG monitoring for evaluation of arrhythmias. Holter monitoring showed episodes of paroxystic atrial fibrillation, ventricular extrasystoles and 2 episodes of nonsustained ventricular tachycardia. Given the absence of cardiovascular risk factors and the normal cardiac function until current presentation, the etiology of dilated cardiomyopathy was uncertain. CMR was pursued which depicted delayed post gadolinium enhancement, which supported the diagnosis of myocarditis, probably a complication after COVID-19 pneumonia.

Conclusion

As some immunosuppressive drugs (e.g. tacrolimus) proved cardiotoxic effects, this etiology should be suspected in transplant patients and should be part of differential diagnosis of dilated cardiomyopathy. Also, transplant patients bring therapeutic challenges in heart failure, given the drug-drug interactions. For this reason, the therapeutic plan in this patient included betablocker as an antiarrythmic drug.

ATRIAL FIBRILLATION IN THE CONTEXT OF STRUCTURAL HEART DISEASE IN CHILDREN

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Nearly half of the cases of atrial fibrillation (AF) in children and young adults are associated with congenital structural heart disease (SHD). AF can also occur in all types of cardiomyopathies, the genetics of cardiomyopathy and the genetics of AF being intertwined.

We are presenting a case series of five patients admitted to the Children's Clinical Emergency Hospital „Marie S. Curie" in Bucharest from 2012 to 2022, with a diagnosis of both AF and SHD. We collected the data from their electronic medical records. We also compared our findings with data we found in literature.

Ten children were admitted with AF in the past ten years. We selected five patients who presented AF in the context of SHD, namely: atrioventricular canal defect associated with anomalous pulmonary venous drainage (surgically corrected), Ebstein anomaly (after cardiac surgery), obstructive hypertrophic cardiomyopathy, restrictive cardiomyopathy and arrhythmogenic right ventricular dysplasia. The common risk factor identified was atrial dilatation and/or surgical scars. A comprehensive paraclinical evaluation was performed, including blood tests, repeated electrocardiograms and echocardiographies, ECG Holter monitoring and, in 2 cases, cardiac MRI. During the AF episode, all five patients were hemodynamically stable. Pharmacological conversion to sinus rhythm was obtained in four of five children, the treatment options included Amiodarone, Amiodarone+Verapamil and Amiodarone+Metoprolol+Digoxin. Chronic antiarrhythmic and anticoagulant treatment was administered in all five patients.

As seen in literature, the occurrence of children with AF was sparse. Moreover, all the mentioned patients also suffered from SHD. Atrial dilatation remains the main risk factor for AF. The two cases with operated cardiac malformations presented with low/medium heart rate AF in contrast to those with cardiomyopathy who had fast heart rate AF. No spontaneous conversion to sinus rhythm was seen in our patients; pharmacological conversion was succeeded in four of them, two necessitating a combination of antiarrhythmic drugs.

COMPLEX ATRIAL TACHYARRHYTHMIAS IN ADULT PATIENT WITH COR TRIATRIATUM

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Introduction

Cor triatriatum or divided left atrium is a rare cardiac congenital disease in which the left atrium is divided into 2 chambers by a fibromuscular diaphragm that will cause blood flow obstruction to the left ventricle. Depending on the degree of obstruction and the accompanying symptoms, cor triatriatum can be diagnosed at any age. Patients with cor triatriatum carry the risk of arrhythmias, especially atrial tachycardia, atrial flutter and atrial fibrillation. Arrhythmia management considers pharmacological treatment, electrical cardioversion in case of hemodynamic instability and if the arrhythmia persists, ablation may be helpful. The treatment of congenital pathology is surgical, by removing the membrane that separates the atrium.

Materials and Methods

We present the case of a 50-year-old female patient, known with extrasystolic supraventricular arrhythmia treated with sotalol, who addresses for resting dyspnea, palpitations and dizziness installed during the night before the presentation. Ecg reveals multifocal atrial tachycardia which under amiodarone become hemodynamically instable requiring electrical cardioversion. Transthoracic and transesophageal echocardiography emphasize the sinister cor triatriatum.

Results

The initial evolution was favorable with antiarrhythmic prophylaxis but 6 months later, she develops a new supraventricular arrhythmia, atypical flutter, resistant to pharmacological treatment and very symptomatic, being proposed for ablation, using the CARTO coherent mapping system.

Conclusion

Cor triatriatum sinister has various anatomical variants and is often associated with other cardiac abnormalities. Imaging techniques are highly informative for suggest the complex anatomical structures. The intra-atrial membrane, which divides the atrium, could be excitable tissue and an arrhythmogenic substrate. Some rhythm disorders can be treated with drug therapy, but resistant arrhythmias may require additional interventional treatment.

DEPRESSIVE SYNDROME AND RHYTHM DISORDERS IN THE ELDERLY - CLINICAL-FUNCTIONAL CORRELATIONS

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Introduction: Depressive syndrome can be considered a complex symptomatology, composed of a collapse of basal emotional feelings, with loss of feelings of self-esteem, prolonged pessimism, darkening horizons and aggravated despair. These phenomena can sometimes be experienced by the patient in the form of "vital sadness" or "painful psychic anesthesia." Thus, complex symptoms can lead to sometimes misinterpretations, and depression can be relatively easily confused with bipolar disorder, which requires a different clinical and therapeutic approach. Therefore, an attempt was made to correlate and differentiate the two pathological entities by analyzing the heart rhythm, which is controlled by the autonomic nervous system and provides an objective indication of the resting cardiac vagal tone.

Material and method: The paper is a retrospective study conducted over a period of 7 months on a number of 76 patients aged 64 to 84 years, the average age being 70.2 for females and 72.1 for males, hospitalized and monitored in the Clinical Hospital of Psychiatry Iasi. The clinical parameters followed were neuro-psychiatric symptoms, blood pressure, central and peripheral heart rate, and examinations performed included electrocardiogram (3 electrocardiograms were performed every 15 minutes) and exercise electrocardiogram.

Discussions: The distribution by sex shows a predominance of cases in men (49 cases, respectively 64.4%), with a B / F ratio of 2.2 / 1. The highest frequency was in the age group 70 - 79 years (63.4% of cases). The two neuro-psychic pathologies were analyzed, which were correlated with physical exertion or psycho-emotional factors, and which can be used in current practice for differential diagnosis, especially in the case of changes in sinus rhythm on the resting electrocardiogram.

Conclusions: The results showed that vagal tone and high levels of inflammatory biomarkers (C-reactive protein) can distinguish bipolar disorder from major depressive disorder, the latter showed higher values of sinus rhythm.

HEART RATE VARIABILITY IN SARS-COV 2 INFECTION

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The COVID-19 pandemic has shown how vulnerable every system in our body is in the face of SARS-CoV2 infection. Even though COVID19 is a disease that affects primarily the respiratory system, new data has shown a strong connection between the presence of the SARS-CoV2 infection and cardiovascular pathology generated especially from autonomic disturbance. A non-invasive method of evaluating autonomic function is the use of heart rate variability (HRV).

This paper evaluates the relationship between HRV as a marker of autonomic regulation and SARS-CoV2 infection.

This retrospective study includes 110 patients of the Cardiology clinic starting in August 2020 diagnosed with SARS-CoV2 infection or in the first month post-COVID19.

The patients were evaluated at admission and further after 3 months post-COVID19. ECG monitoring was obtained with HRV being evaluated in time-domain, inflammatory markers and severity of SARS-CoV2 were evaluated.

At the initial evaluation symptomatic patients with SARS-CoV2 infection had significantly lower HRV compared to the values obtained after 3 months. Moreover there is an inverse correlation between RR variability and inflammatory status.

In conclusion patients with SARS-CoV2 infection experienced autonomic dysfunction as evidenced by lower HRV present at the beginning of the infection and in the first month post-acute infection with improvement at 3 months from the initial positive test. This aspect suggests a strong temporal relationship between autonomic dysfunction and COVID19.

HEART RATE VARIABILITY AS AN NON INVASIVE METHOD TO EVALUATE AUTONOMIC IMBALANCE IN ISCHEMIC STROKE

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Stroke is one of the main causes of mortality around the world. Autonomic nervous system dysautonomia is frequently associated with stroke and there is a proven correlation between this and cardiovascular complications, from which proarrhythmic status is one of the most feared.

Heart rate variability can be considered as an independent risk and prognostic factor for patients with ischaemic stroke.

This paper aims to show the correlation between autonomic disturbance as evaluated with heart rate variability (HRV) in the presence of acute ischemic stroke.

The study comprised of 50 patients who were admitted for acute ischemic stroke and were evaluated by the Cardiology department in the first week after the acute event and reevaluated after 2 months. Patients were evaluated at admission with imagistic scanning (CT or MRI), long duration ECG monitoring using 12-lead electrocardiograms and functional status. At the 2 month reevaluation the same data was obtained. Patients with severe neurological impairment and extensive lesions presented with low heart rate variability as an expression of autonomic disturbance. At the 2 month reevaluation the degree of heart rate variability is in relationship with the severity of the functional status and the evolution of the cerebral damage.

The results support the hypothesis of continued autonomic dysfunction even after partial recovery from ischemic stroke. Further investigation is required to evaluate the importance of HRV in the prognosis and mortality of stroke patients.

HEMODINAMICALLY UNSTABLE TACHYARRHYTHMIAS IN A PATIENT WITH RIGHT ISOMERISM AND COMPLEX CONGENITAL HEART DISEASE

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Introduction

In the early postoperative status after cardiac surgery for complex congenital heart defects (CHD), ventricular and supraventricular arrhythmias can be life-threatening, especially in the context of severe ventricular hypertrophy and univentricular correction.

Methods

We are presenting the case of AN, a 5-years-old girl with a complex cyanogenic structural heart disease: right isomerism, complete atrioventricular canal with single functional ventricle, total anomalous pulmonary venous return, anomalous systemic venous return, double outlet right ventricle with pulmonary valve pseudoatresia. She underwent a palliative procedure – a bidirectional cavo-pulmonary anastomosis (Glenn procedure) accompanied by the correction of the total anomalous pulmonary venous return. Postoperatively, she developed repeated hemodynamically unstable ventricular tachycardia and supraventricular tachycardia associated with other complications, such as chylothorax, acute kidney injury and iliac deep vein thrombosis.

Results

The patient required extensive therapeutic management especially for the arrhythmias and chylothorax and was hospitalized for over a month in the Cardiovascular Intensive Care Unit; the arrhythmic burden was controlled by combining the antiarrhythmic therapy with strict hydro-electrolitic equilibration and adequate chylothorax treatment.

Conclusion

This case is intended to emphasize the importance of ventricular and supraventricular tachycardia in the postoperative management due to the fact that it can lead to prolonged hospitalization, significant clinical deterioration or even death. Patients with complex CHD and associated risk factors tend to poorly tolerate sustained tachyarrhythmias, regardless of their type.

MAXIMAL INTERVENTIONAL APPROACH IN A PATIENT WITH ARRHYTHMIA-MEDIATED CARDIOMYOPATHY - CASE REPORT

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Introduction

Tachycardiomyopathies represent an important cause of left ventricular (LV) dysfunction.Two categories of this condition exist:arrhythmia-induced cardiomyopathy (arrhythmia is the only reason for ventricular dysfunction) and arrhythmia-mediated cardiomyopathy (when another structural heart disease is co-existing).

Methods and Results:

We present the case of a 63-year-old male patient, former smoker, diabetic, known with chronic anteroseptal and inferior myocardial infarction, percutaneous coronary stent angioplasty of the right coronary artery, quintuple coronary artery by-pass grafting (CABG) and chronic heart failure with preserved ejection fraction (EF) who presented in the emergency department for dyspnea at medium-low exertion, accompanied by fatigue and dry cough, symptomatology with onset two months before with progressive worsening. The electrocardiogram revealed atrial fibrillation (AF) 135 bpm alternating with non-sustained ventricular tachycardia (VT) with a right bundle branch morphology. Echocardiography revealed dilated cardiomyopathy with LV EF 15% by regional wall akinesia, otherwise diffuse hypokinesia. Coronary angiography ruled out a possible ischemic cause (permeable CABG). Intravenous amiodarone infusion therapy has been initiated but led to acute drug-induced hepatitis requiring discontinuation. 24-hour.Considering the newly diagnosed AF without previous oral anticoagulation, but the persistence of high heart rates, external electrical cardioversion of AF was attempted after transoesophageal echography, without success. The treatment with digoxin was delayed due to hydroelectrolytic disorders and multiple PVCs, the dose of beta-blocker was increased and the treatment of heart failure was optimized by introducing ARNI and SGLT-2 inhibitor.The patient was directed to electrophysiology department where radiofrequency ablation of the septal ectopic focus was performed obtaining a transient abolition of PVCs. However, non-sustained VT post ablation reoccurred and another radiofrequency ablation for AF was performed, without success. The LV EF has mildly improved. The patient was scheduled for reintervention and was indicated an ICD.

Conclusion

Tachycardiomyopathy represents an elusive diagnosis that demands a careful clinical approach and particularly tailored strategy.

PHARMACOKINETICS OF APIXABAN TREATMENT IN HAEMODIALYSIS PATIENTS

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It is unclear whether acenocumarol is protective or harmful in patients with ESRD and atrial fibrillation. This problem raises the question of whether alternative anticoagulants may have a well-deserved role. In this paper, we tried to determine apixaban pharmacokinetics, at different concentration, in hemodialysis patients.

Thus we included 9 patients, to whom we measured anti-factor Xa activity as follows: initially we started with a dose of 2.5 mg and after one month of treatment we measured anti FXa activity on a day without dialysis. Afterwards we stopped apixaban treatment for one month, considered as a wash-out period, time during which we switched to acenocoumarol. After this period we restarted apixaban treatment for another month with the 5 mg dose, rechecking at the end of this period the result of the anti FXa activity.

Chronic oral anticoagulant treatment is indicated for many dialysis patients, especially due to the increased prevalence of atrial fibrillation and other thromboembolic pathologies. We wanted to evaluate the safety and effectiveness of the current apixaban recommendations "in real life". We included inpatients from the Cardiology Clinic, and although it was a relatively small number, we can say that we had interesting results using apixaban 2.5 mg twice/day vs. 5 mg twice/day.

Apixaban 2.5 mg twice daily resulted in the same anti-FXa values, comparable to that of the standard dose (5 mg twice/day) in patients with normal renal function, and could be a reasonable alternative to acenocumarol for the prevention of stroke and systemic embolism, in dialysis patients. Apixaban 5 mg twice daily showed supra-therapeutic levels in these patients and should be avoided.

PREDICTORS OF ATRIAL FIBRILLATION RECURRENCE IN CARDIOVERTED PATENTS USING OUTPATIENT HOLTER EKG MONITORING

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Introduction

Established Atrial Fibrillation remains a significant cause of disability and morbidity worldwide accounting for a significant amount of preventable hospitalizations. Predictors of late recurrence of Atrial Fibrillation (LRAF) analyzed by follow up Holter Electrocardiography were evaluated in a group of patients whom have undergone medical or electrical cardioversion.

Matherials and Methods

An analytical retrospective study comprising of 100 patients seen in the outpatient setting (mean age: 67 years, 45% women, paroxysmal AF: 70%), without recurrence of AF within 12 months and without antiarrhythmic drugs use. Potential predictors of AF recurrence in Holter electrocardiography analysis used were: the atrial premature complexes (APC) burden; the prematurity index of the APC, and the profile of the APC.

Results

Twenty five patients (25%) had LRAF during the follow-up period. The cumulative incidence of APC burden in the patients found with LRAF (0.310% [95%CI, 0.078 to 1.308]) was significantly greater than in those without LRAF (0.128% [95%CI, 0.051 to 0.478], p=0.020), shorter minimum prematurity index of the APCs (45 ± 7 vs 54 ± 8, p=0.001), and longer number of APC run 6 (4 to 12) vs 3 (0 to 6), p=0.015. The optimal cutoff value for the APC burden, maximum number of APC run, and minimum prematurity index of the APC to predict LRAF was 0.160%, 10%, and 50% respectively. The multivariate analysis using Cox regression method proved that the minimum prematurity index of the APC (⩽50%) was strongly associated with LRAF.

Conclusion

In patients with late recurrence of atrial fibrillation without antiarrhythmic drugs, the minimum prematurity index of the APC (⩽50%) found on outpatient Holter ECG monitoring at 12 months after conversion can be considered an independent predictor of arrhythmia recurrence and could play an important role in further deciding therapeutic strategies and long term follow-up.

PROGNOSTIC VALUE OF VENTRICULAR LATE POTENTIALS IN PATIENTS WITH MYOCARDIAL INFARCTION

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Late potentials have a powerfull negative predictive value and their appearance was determined by: infarct location and evolution of ischaemia in acute phase- so patients with residual angina, silent ischaemia or infarct extension had a higher incidence of late potentials. The appearance of late potentials after acute phase was always associated with enzyme elevation and reinfarction. Incidence of late potentials tend to rise in parallel with Killip class, magnitude of myocardial infarction and the hemodynamic response is according to tissue involvement. Thrombolysis lowers the incidence of late potentials in the acute phase. Our data suggest that also metabolic treatment reduce the incidence of late potentials. Their appearance does not depend on age or gender. Factors that influence the evolution of late potentials are: persistence of ischaemia, hemodynamic status and treatment. And their expresion depends on autonomic factors, RR variability, diselectrolitemia, silent ischaemia and ventricular arrhythmias – holter documented, and treatment with betablockers.

It is useful to determine late potentials in the first 3 years after myocardial infarction in patients with documented arrhythmia, because they allow risk stratification- those with sustain ventricular tachicardia and late potentials had a mortality risk 7 times higher. Autonomic imbalance association to late potentials rise the mortality risk 3 times. Predictive value of late potentials is much powerfull for anterior myocardial infarction with a better sensitivity and specificity with better diagnostic accuracy.

Late potentials represent the expresion of the alteration of electrophysiological properties of the ischaemic myocardium, being a noninvasive marker of arrhythmogenic substrate. The presence of the arrhythmogenic substrate is not equivalent with reentrant arrhythmia, a major role is played by autonomic factors, electrolite disturbances, ischaemia itself and the fact that an arrhythmogenic substrate might be protected by an entry or exist block.

RR VARIABILITY AND LATE POTENTIALS AS PREDICTORS FOR ATRIAL FIBRILLATION POST MYOCARDIAL INFARCTION

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RR variability represents an expression of autonomic imbalance and there is a strong correlation between autonomic imbalance and electrical vulnerability both prone to sudden cardiac death. It is common knowledge now that low vagal tonus augments sympathetic arrhythmogenic effects. So RR variability and late potentials - as marker of electrical vulnerability, might be considered as risk predictors for life - threatening arrhythmias. But this is true also for atrial fibrillation.

We studied 516 patients with myocardial infarction. We assess clinical status, standard ECG, SAECG, RR variability, echo parameters in all patients. Mean follow-up period 5 years.

Autonomic imbalance enhance the risk for atrial fibrillation. As expected, patients with atrial fibrillation had a worse prognosis with higher mortality and hemodynamic impairment vs those in sinus rhythm. Women had a higher risk of atrial fibrillation. There were no statistic significance in age, myocardial infarction type, presence of diabetes mellitus and systemic hypertension. Patients with atrial fibrillation had reduced RR variability in time domain and frequency domain analysis and reduced ejection fraction.

Arrhythmic death was higher in patients with reduced RR variability, autonomic imbalance revealed the electrical vulnerability of ischemic myocardium.

RR variability is an independent prognostic marker and its positive predictive value is higher in correlation with late potentials, ejection fraction and global longitudinal strain.

T-WAVE MEMORY REALLY EXISTS: CASE PRESENTATION

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Introduction

The electrocardiographic presence of deep T-wave inversions in a pacient with cardiovascular risk factors, presenting with chest pain is highly concerning for cardiac ischemia. However, there are certain situations when this finding may represent a benign phenomen. One of the rare causes of diffuse T-wave inversion in electrocardiogram (ECG) is cardiac memory. This is a unique phenomen consisting of persistent T-wave changes that mimic myocardial ischemia. This finding is most often encourtered after the heart resumes a sinus rhythm after an event that causes abnormal electrical activation patterns, such as bundle branch block.

Methods

We are presenting the case of a 58-year-old female patient, hypertensive, dyslipidemic, known with effort angina for several years, who was presenting for worsening of the angina pectoris in the last two weeks, also accompanied by dyspnea. The initial ECG showed a sinus rhythm at a rate of 55 beats per minute with deep symmetrical T-wave inversion noted in leads V1 through V4. The echocardiography revealed only hypokinesia at the base of the interventricular septum and the troponin level was normal. After a few hours, a second ECG was obtained, showing left bundle-branch block at a rate of 70 beats per minute.

Results

The patient underwent coronary angiography because of her unstable angina, epicardial coronary arteries being normal. Given the changes on the initial ECG and the normal coronary arteries, we considered that the T-wave inversion is the expression of the cardiac memory phenomen. Moreover, the angina pectoris was assigned to microvascular angina. The patient's evolution was favorable under the new therapeutic scheme with anti-ischemic therapy, without the recurrence of the chest pain.

Conclusion

Despite their relatively benign nature, the cardiac memory phenomen is under-recognised, but important for health care providers to differentiate it from ischemic changes, in order to facilitate appropriate evaluation and management.

VENTRICULAR TACHYCARDIA AS INITIAL MANIFESTATION OF ARRHYTHMOGENIC RIGHT VENTRICULAR CARDIOMYOPATHY

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We present a case of a 28-year-old young football athlete who presented in the Emergency Department of our hospital with palpitations and shortness of breath that occurred during his physical training. His medical and family history was not significantly marked by relevant disease.

The ECG showed wide complex tachycardia with left bundle-branch block morphology and right axis. A therapy with Atenolol iv infusion was started which had a successful effect in reducing tachycardia, then with a short passage in atrial fibrillation. Atenolol was suspended and Amiodarone with anticoagulant therapy was started which allowed a return to sinus rhythm. The patient remained haemodynamically stable. Troponin was weakly positive with a normal electrolyte panel.

The echocardiogram revealed dilation of the right ventricle (PLAX RVOT 38mm), mild tricuspid and mitral regurgitation. A coronary CT angiography was performed that showed a calcium score of 0 and normal coronaries. He underwent a CMR which revealed slightly reduced function and dilation of the right ventricle (RVEF 47%, RVED volume 118ml/m2), with dyskinesia and micro-aneurysms of the mid-basal RV free wall, thus RV findings were suggestive of a diagnosis of arrhythmogenic right ventricular cardiomyopathy.

The electrophysiological study confirmed the presence of ventricular tachycardia that was triggered during programmed ventricular stimulation with a single extrasystole. Tachycardia was well tolerated, the same morphology, terminated by anti-tachycardia pacing.

The patient was discharged with a beta-blocker and recommendation for exercise restriction. ICD placement can be considered, but taking into account the risks and benefits of the ICD (sustained VT and ARVC vs. young age and device complications), the heart team decided temporarily not to implant it.

To complete the assessment, he will undergo genetic testing.

During the follow-up period, the patient was doing well with no reported symptoms or recorded arrhythmias