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Report

Catching Congenital Heart Disease in Adulthood with Mirror-like Arrhythmias

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Abstract

This present casework concerns CHD with mirror like arrhythmias in a 64-year-old male which is accompanied by a large thrombus in right atrial chamber as seen through echocardiography. It isn't a common presentation and since the patient came with signs that are not characteristic of CHD, several tests were done to arrive at the diagnosis of CHD through various images and examinations. The arrhythmogenic substrate for any adult CHD is versatile and encompasses all the variations of arrhythmias seen in normal adults, and however specific to congenital malformations such as WPW and Ebstein's anomaly. The management of these arrhythmias depends on the severity; a walker may require an occasionally follow-up while one with symptoms like syncope will require invasive tests like cardiac catheterization and programmed electrical stimulation. Chronic VFIB/PVFIB is treated by antiarrhythmic medications and AICDs, while IART is treated by catheter ablation. This case shows that there is a need to improve public aw.reness regarding CHD in adults particularly when complicated by atypical arrhythmias. International and local approaches should be tailored to increase survival rates of patients and improve the diagnostic processes.

Keywords

Adult Congenital Heart Disease, Arrhythmias, Right Atrial Thrombus, Diagnostic Challenges and Management Strategies

1. Backgraound

Congenital heart disease or congenital cardiovascular anomalies refer to different defects of the cardiac structure existing at birth, being identified in about 1% of all neonates worldwide. Medical and surgical technologies have continued to evolve making them suitable for pediatric use, meaning that a large population of adults with CHD continue to live with the conditions. We are now aware that more than 1.4 million adults in the United States have CHD, and the number increases as children with CHD become adults [1, 2]. Death due to CHD in adults has continuously increased as a trend yet absolute diagnosis is still a rarity. CHD subjects, especially those with asymptomatic complaints many develop peculiar manifestations or sequelae later in life hence being diagnosed or treated inappropriately. It is important to detect CHD in adults since people of this age receiving no regular check-ups may have severe consequences such as heart failure, arrhythmia, or higher morbidity and mortality rate [3, 4]. This case report presents a rare case of CHD in a 64-years-old male

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patient with mirror-like arrhythmias and right atrial thrombus. It stresses the importance of CHD in the people with presented atypical symptoms and underlines that the right and early diagnosis and intervention can improve the quality of life significantly [5, 6].

2. Case Presentation

2.1. Patient Information

a) Age: 64 years.
b) Gender: Asian male.
c) Relevant Medical History: The patient has numerous chronic diseases, such diabetes mellitus, hypertension, her appendectomy and a laparoscopic cholecystectomy.

2.2. Presenting Symptoms

The patient presented it to the emergency department with several concerning symptoms that required immediate evaluation:

a) Palpitations: He said he had had episodes of palpitations, and he used words like uncomfortable and alarming to describe his feelings.
b) Syncope: A transient episode of loss of consciousness was noted in the patient and raises a question of possible cardiology problems.
c) Near-Syncope: He also presented with history of episodic dizziness and a feeling of near syncope, which pointed towards unstable cardiovascular status.

2.3. Clinical Findings

The clinical evaluation revealed several significant findings relevant to the patient's symptoms and medical history:

Thrombosis: The echocardiogram revealed a large thrombus within the right atrium, which is dangerous due to patient's palpitations, syncope, and near syncope. But this finding creates a certain concern for the occurrence of thromboembolic events, which can result in complications such as a stroke or pulmonary embolism.

Thromboembolic Events: Out of these, it is necessary to pay special attention to the association between thrombosis and tachycardia. Their paroxysms of tachycardia may be evidence of arrhythmia, so I formed the conclusion of possible thromboembolic complications. This fact underlines the importance of a comprehensive physical check-up and diagnostic work-up in cases of arrhythmia-related complaint.

2.4. Diagnostic Assessment

Eventually, a systematic diagnostic approach was used to assess the symptoms of CHD patient and associated complication.

1) Initial Evaluation:

The patient received an assessment in the ED to assess the complete health history and conduct a primary assessment. Palpitations, syncope and near syncope the past difficulties with diabetes and hypertension created concern about cardiac problems.

2) Imaging Studies:

Echocardiogram: Shown a large thrombus located in the right atrium, important for interpretation of the patient's arrhythmias and thromboembolic potential.

Electrocardiogram (ECG): Demonstrated tachycardia, which correlated with the described symptoms.

3) Differential Diagnoses Considered:

Differential diagnoses included:

a) Atrial Fibrillation: A prime consideration given tachycardia and thrombus formation, which are associated with ischemic stroke and thromboembolic incidents.
b) Supraventricular Tachycardia (SVT): They are recommended following episodes of tachycardia.
c) Ventricular Tachycardia: Although less likely, serious arrhythmias in heart disease formed part of why it could be considered.
d) Pulmonary Embolism: The thrombus made some concerns for possible pulmonary embolism in view of syncope symptoms in this patient.

4) Genetic Testing:

Genetic testing is not carried out at the start but might be considered if there is a suspicion of inherited disorders associated with CHD or arrhythmia, such as the Long QT syndrome.

5) Final Diagnosis:

The identification of congenital heart disease with thrombus formation in right atrial chamber was made based on imaging modalities show in Figure 2, clinical manifestations and history of the patient. This required a specific handling method that would respond to the arrhythmias as well as being anti-thromboembolic.

Figure 1 Echocardiographic image of a large thrombus identified in the giant right atrium of a patient with an "old-style" Fontan procedure using an aortopulmonary anastomosis.

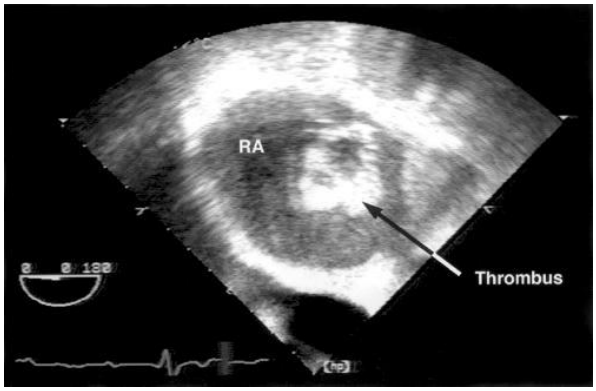

Figure 1. *Echocardiographic image of a large thrombus.*

2.5. Unusual Symptoms or Complications

Mirror-like Arrhythmias: The patient had palpitations that he described as 'mirror-like' which meant that the pattern of arrhythmia was somewhat rare. This pattern of presentation was considered to be incongruous with typical APC and raised the possibility of other structural heart abnormalities which required further evaluation.

Syncope and Near-Syncope: It is uncertain whether specialists can reassure patients of milder SOFA grades or not, but patients with syncope or near-syncope should be considered to have severe cardiovascular instability and can have potential arrhythmias or structural heart diseases.

Atypical Clinical Presentations:

Complex Arrhythmogenic Substrate: The involved arrhythmias in this patient were complex and could not be just categorized under certain basic frequency patterns, so it was not easy to determine their link with CHD. There were two arrhythmias, tachycardia as well as other conditions that required close observation and assessment in order to determine the most proper way of addressing them effectively.

Delayed Diagnosis: The patient had a rare combination of symptoms that failed to alert the doctors as an unusual symptom cluster in an elderly diabetic hypertensive person might do. CHD can be asymptomatic, and it can go underdiagnosed in healthcare settings, especially if older patients are involved.

Challenges Faced:

Need for Comprehensive Evaluation: The presented symptoms were atypical and prompted complex, team-based diagnostics including cardiologists, electrophysiologists, and imaging physicians with multimodality imaging approach.

Management of Thromboembolic Risk: Figuring out the thrombus involvement necessitated consideration about the anticoagulation therapy and arrhythmia: risks associated with anticoagulation and bleeding irrespective of the general health profile of the patient.

2.6. Management and Treatment

Treatment Plan:

The approach to treating CHD with thrombus formation was performed using various medical and interventional techniques**.**

a) Medical Management:

Anticoagulation Therapy: Because the thrombus in the right atrium was large, the patient was started on warfarin to decrease the risk of thromboembolism. As in other patient scenarios, potential anticoagulants such as warfarin or DOACs are contemplated in consideration of the patient's renally clearance and other interacting medications. Antiarrhythmic Medications: Tachycardia and unsteady heart rhythm is not desirable and to return it to normal the patient was prescribed various antiarrhythmic medications including beta-blockers or calcium channel blockers for the palpitations [7].

b) Interventional Approaches:

Cardiac Catheterization: Cardiac catheterization was carried out to assess heart hemodynamics and define the nature of the arrhythmogenic substrate and other structural abnormalities responsible for patient's symptoms [8].

Catheter Ablation: If such complex arrhythmia remained symptomatic, catheter ablation could have been performed occasionally. This procedure focuses the electrical signals on some areas of the heart that are connected with irregularities, with a hope of returning to normal or standard pattern [9].

c) Surgical Considerations:

Surgical Intervention: According to data of cardiac catheterization and the patient's general state, it could be necessary to intervene on anatomical malformations that led to arrhythmia and thrombus formation, like, for example, the defect in atrial septum or other pathological changes.

2.7. Patient Response to Treatment

Initial Response: Initially they did well on anticoagulation therapy, however, the palpitations decreased, and the client's heart rate became more stable. Supervision of coagulation profile like INR for warfarin was desirable to ensure optimal therapeutic level and to prevent risks of bleeding [10].

Symptom Management: The use of other anti-arrhythmic drugs considerably diminished attacks of tachycardia and positively affected the quality of life of the patient. Based on data of the reported adverse events the patient referred to fewer episodes of syncope and near-syncope since the beginning of treatment.

Modifications Made:

Adjustment of Anticoagulation: Any changes in symptoms of thromboembolism or side effects to anticoagulants required a modification of the medications and schedule of the next follow-up visit.

Reassessment of Antiarrhythmic Therapy: During breakthrough arrhythmias, the antiarrhythmic regimen was assessed for the possibility of drug substitution or different dosage to achieve best control of the arrhythmia [7].

Follow-Up and Long-Term Management:

Subsequent check-up visits were done to ensure careful observation of the cardiac status, assessment of impact of treatment plan and to modify the plan if need arose. The long-term treatment was continuation of anticoagulation, and echo control every 6 months to check the thrombus situation and the general status of cardiac pathology [8].

3. Discussion

1) Significance of Diagnosing Congenital Heart Disease (CHD) in adults:

The detection of CHD in adults is very important because they have different problems and risks than children who have CHD. Due to the increased survival of children suffering from CHD, we realize there are a lot of adults with such congenital disorders. Some may initially complain of nonspecific symptoms or systemic manifestations or develop exacerba-

tions that, if not identified, may cause severe and potentially fatal consequences [11]. Ideally diagnosing patients with JHD in early stages ensures that appropriate therapeutic measures are taken to improve his or her lifestyle quality and decrease chances of developing long courses of the diseases of heart failure, arrhythmias, and thromboembolic events [12] Figure 2 show survival curve.

Figure 2 Survival curve in late follow up of adult patients with tetralogy of Fallot. Most deaths were sudden; increased mortality in late decades of follow-up has also been observed in other series with permission of the publisher.

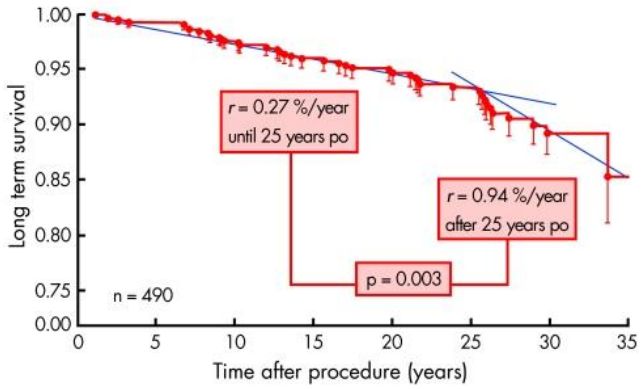

Figure 2. *Survival curve in late follow up of adult patients with tetralogy of Fallot.*

2) Comparison with Similar Cases in Literature:

Many papers have presented cases of adults diagnosed with CHD in the later years of their life, often ignoring signs that they attributed to other illnesses. For instance, Stout and Broberg (2016) described a case of an unsolved atrial septal defect in an adult presenting with palpitations and syncope, like the existing case. Both cases, which include arrhythmias and other thrombus formation underline the crucial importance of increased index of suspicion for CHD in adult patients with ambiguous cardiovascular symptoms. These cases underscore the need for good assessments and Clinicians need to consider CHD in their list of diagnoses.

3) Potential Reasons for Late Diagnosis and Implications for Practice:

Several factors contribute to the late diagnosis of congenital heart disease (CHD) in adults:

Atypical Presentations: Primary symptoms can be very nonspecific and include fatigue, palpitations, or syncope After age 40, symptoms may be attributed to anxiety or aging [9].

Lack of Awareness: There is poor knowledge of the extent of CHD in adults, and they often fail to notice late presentations, thus missing correct diagnoses often [10].

Transition of Care: The survival of infants and children with CHD has improved in recent years and so has the transfer of patients from pediatric cardiology services to adult congenital cardiology services [11]. The implications for practice include has also pointed towards the need to provide better information and to educate healthcare professionals to identify symptoms of adult CHD. Further, introducing ideal patterns of transitional care for pediatrics to adult care also allows targeting long-term follow-up and treatment in people's lives whenever necessary.

4) Lessons Learned and Recommendations for Clinicians:

High Index of Suspicion: There is a need to always have a high index of suspicion for CHD in any adult who presents with unexplained cardiovascular disease and those with history of congenital abnormalities or syndromes or other risk factors such as diabetes and hypertension.

Comprehensive Evaluations: Meticulous clinical assessment including history taking and physical examination and functional assessment coupled with the right imaging studies – echocardiogram, cardiac MRI, or catheterization – are necessary in making appropriate diagnosis.

Interdisciplinary Approach: Teamwork with cardiologists, family physicians and specialists should be practiced in the management of the adults with CHD. Appointing interprofessional partnerships can bring positive characteristics to the delivery of care and the results achieved.

Abbreviations

AICD	Automatic Implantable Cardioverter-Defibrillator
AV	Atrioventricular
IART	Intra-Atrial Re-entrant Tachycardia
CHD	Congenital Heart Disease
TOF	Tetralogy of Fallot
VT	Ventricular Tachycardia

Author Contributions

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Al Mohsen Abbas Jawad Abdulaaima: Supervision

Patient Consent

Confirm that informed consent was obtained from the patient for publication of the case details.

Conflicts of Interest

The authors declare no conflicts of interest.

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