Case report

Right atrial diverticulum associated with the Wolff-Parkinson-White syndrome in a child

Ondřej Materna *, Peter Kubuš, Jan Janoušek
Children’s Heart Centre, University Hospital Motol, Prague, Czech Republic

A R T I C L E   I N F O

Article history:
Received 13 June 2014
Received in revised form 11 July 2014
Accepted 16 July 2014
Available online 7 August 2014

Keywords:
Wolff-Parkinson-White syndrome
Child
Diverticulum
Surgery

A B S T R A C T

A child with Wolff-Parkinson-White syndrome showed large right atrial diverticulum overlying the right ventricle and the right coronary artery at CT angio with right atrial appendage as a separate structure. The accessory pathway was located at the diverticulum. Catheter ablation was not regarded feasible and surgery was indicated. A broad muscular connection between the right atrium and ventricle was interrupted by transection and cryoablation as confirmed by disappearance of preexcitation. This precisely CT documented case represents a rarely reported right atrial diverticulum posing a high risk of life-threatening arrhythmias.

© 2014 The Czech Society of Cardiology. Published by Elsevier Urban & Partner Sp.z.o.o. All rights reserved.

We present a 12-year-old girl who underwent successful surgical treatment of a high risk accessory atrio-ventricular pathway formed by a congenital right atrial diverticulum overlying and connecting to the right ventricular free wall. The girl presented with a Wolff-Parkinson-White (WPW) syndrome having a typical ECG (Fig. 1A) and with congenital heart disease – large perimembranous ventricular septal defect, secundum atrial septal defect, diverticulum of right atrium, left main bronchus stenosis caused by anomalous left pulmonary artery and ligamentum arteriosum. At the age of 5 months she underwent surgical correction – closure of ventricular and atrial septal defects, resection of ligamentum arteriosum and partial narrowing of the right atrial diverticulum inlet. Resection of the diverticulum was felt too risky at that age. Paroxysms of atrio-ventricular reentrant tachycardia could be successfully suppressed by a combination of sotalol and propafenone. The ECG pattern remained unchanged during follow up. At the age of 11 years she was referred for exercise stress testing showing persistent ventricular preexcitation up to the maximum achieved heart rate. Because of the need for combination antiarrhythmic therapy and suspicion of a short antegrade refractory period of the accessory pathway an intracardiac electrophysiological study was indicated [1,2]. A preceding echocardiography and CT angio scan showed a large right atrial diverticulum and a normal right atrial appendage as a separate structure (Figs. 2 and 3). The inlet of the diverticulum overlaid the right coronary artery (Fig. 4). Electrophysiological study confirmed a high risk accessory pathway with an antegrade refractory period <230 ms and the shortest preexcited RR interval during atrial fibrillation of 190 ms. Electroanatomical mapping using the CARTO system revealed a large area of early ventricular activation at the adherence of the diverticulum to the right ventricular free wall. Because of the intimate relation to the right coronary...
Fig. 1 – 12-lead ECG. (A) An unusually pronounced ventricular preexcitation suspicious of a broad muscular connection between the right atrium and right ventricle. P waves are largely buried in the delta wave. (B) Partial disappearance of preexcitation with a residual delta-wave (arrow) during surgical dissection of the accessory pathway. (C) Final disappearance of preexcitation.
artery and presumed broad muscular connection between the diverticulum and the right ventricular free wall it was decided to refrain from RF catheter ablation and to indicate surgical treatment. The diverticulum was disconnected from the right ventricle by transection and cryoablation as confirmed by gradual decrease (Fig. 1B) and final disappearance of preexcitation (Fig. 1C) and then sutured back to allow for drainage of associated coronary veins. Six months after the surgery and discontinuation of all antiarrhythmic medication the patient remains free of preexcitation and supraventricular tachycardia. Several cases of a WPW syndrome with an epicardial pathway running through the right atrium appendage that was diffusely adherent to the right ventricle were described in the literature [3,4]. Surgical dissection or catheter ablation led to loss of preexcitation and no further tachycardia. In our case we have seen a normal right atrial appendage and the diverticulum was a separate structure. We found a similar case in the literature where the right atrium appendage was described as separate structure, but there was no other associated congenital heart disease and surgical treatment was not successful [5]. In our case surgery was effective and safe in the treatment of this high risk WPW syndrome.

**Conflicts of interests**

We disclose any actual or potential conflict of interest.

**Funding body**

Supported by Ministry of Health, Czech Republic - conceptual development of research organization, University Hospital Motol, Prague, Czech Republic 00064203.

**Ethical statement**

We state that the work was done with respect to all ethical standards.
Informed consent

We state that the patient agreed to participate in the research.

REFERENCES


