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Case(s) Report
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Fetal diagnosis of a right ventricular aneurysm case with favorable outcome

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Abstract

Objective: Congenital ventricular aneurysms located in the right ventricle are very rare abnormalities.

Case(s): We describe a case of prenatal diagnosed right ventricle aneurysm which ended with favorable outcome. Fetal echocardiography demonstrated a 20x20 mm aneurysmal image outpouching from the basal region and free wall of the right ventricle in a 35- year-old multigravida woman at her 37th gestation week. This case had intermittent bradycardia in the postpartum first days. In pediatric cardiology examinations at the 1st, 3rd , 6th month and 1st year postnatally, it was observed that aneurysmatic formation partially regressed compared to the prenatal period.

Conclusion: Prenatal diagnosis of these abnormalities allows to have a favorable prognosis via a multidisciplinary collaboration in intrauterine and postnatal period.

Keywords: ventricular aneurysm, fetal echocardiography, prenatal ultrasound

Introduction

Congenital fetal ventricular aneurysms and diverticula are rare abnormalities (reported incidence of 0.5 in 100000 live births) although true incidence could not be determined due to many cases that remained asymptomatic and these terms can be used interchangeably in the literature. They appear on the 4-chamber view as an outpouching presentation of the ventricular wall.[1,2] Increasing number of cases diagnosed in the prenatal period may be associated with increased experience in fetal echocardiograpy. It is important to recognize these cases in the prenatal period, since prenatally diagnosed cases are more frequently detected with pericardial effusion, heart failure, thromboembolic conditions, intrauterine and/or postnatal death. However, isolated ventricular outpouchings are often have good outcomes.[3] In this report, we presented a case of prenatal right ventricular aneurysm diagnosed by fetal echocardiography.

Case(s)

A 35- year-old multigravida Syrian refugee woman, without any medical history, was referred at 37 weeks of gestation for abnormal cardiac morphology. Fetal echocardiography demostrated a 20x20 mm aneurysmal image outpouching from the basal region and free wall of right ventricle with a wide mouth opening into the cavity (Figure 1). While the thickness of the right ventricle free wall was 4.4 mm in diastole, the thickness of aneurysmatic portion was 3mm. Contraction of this relatively thin-walled aneurysmatic portion was poor. (Figure 2). Fetal cardiac rhythm was regular. There wasn't any other abnormality in the sonographic examination. Sequential examinations at 38 and 39 weeks demonstrated the persistence of aneurysmal image without changing its size, with no arrhythmias and no pericardial effusion and cardiac failure. The female baby was born by spontanously vaginal delivery at a gestational age of 39+3 weeks and weighed 2430 g. Postnatal echocardiographic

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findings confirmed the prenatal findings. The baby was evaluated with Holter electrocardiography because she sometimes had bradycardia. At postnatal third day Holter electrocardiography was normal. Bradycardia wasn't detected after third day. Although there is no evidence showing the benefit of aspirin in this regard, the baby discharged with aspirin profilaxis for the prevention of thrombosis in the aneurysm. A postnatal follow-up in the Pediatric Cardiology Unit was performed at the 1st, 3rd, 6th and 12th month of life. During this period of observation the patient remained asymptomatic and a partial regression was observed. Aspirin was discontinued at the 3rd month of life.

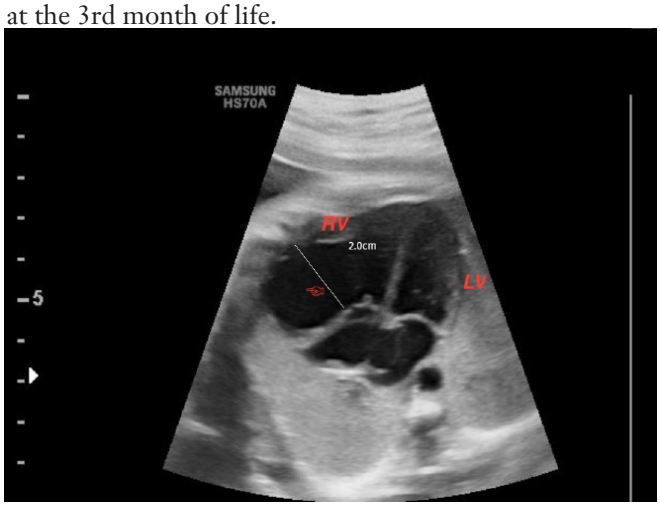

Fig. 1. Fetal ultrasonographic four-chamber view showing the aneurysm arising from the right ventricle with a broad base. RV; right ventricle LV; left ventricle

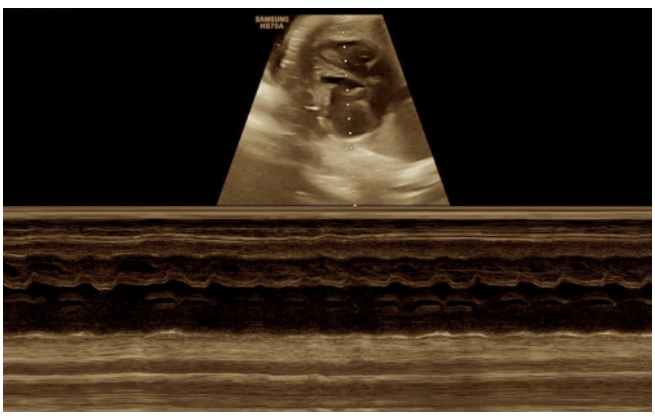

Fig. 2. Fetal M-mode ultrasound showing the hypokinetic wall motion.

Discussion

Among the aneurysm and diverticulum, the most rare one is right ventricular aneurysms with a rate of 9%. While diverticulum is more common in the right ventricle, aneurysm has been reported more frequently in the left ventricle.[4] Although we could not make a definitive diagnosis histopathologically, our case was considered as an aneurysm because of its echocardiographic features (large size of the communication with the ventricle, thin-walled, and poor contractlity). In Table 1, differentiation of diverticulum and aneurysm is classified according to morphological and histological features.[4-7]

Table 1. Differentiation of diverticulum and aneurysm is classified according to morphological and histological features[4-7].

	Diverticulum	Aneurysm
Communicating	Narrow	Broad base
Wall contractility	Synchronously with the ventricle	Hipokinetic, akinetic
Histologic layer	All 3 layers present	Usually disorganized or absent myocardium with fibrosis
Localization	Uusually at apex	Usually connected to subvalvular areas
Other anomalies	Usually associated	Usually isolated

The etiology of aneurysm and diverticulum is unknown. Focal defects in the muscular ventricular wall development during embryogenesis may lead to these pathologies.[8] They can also be acquired in the prenatal period from a viral infection, inflammatory diseases, or postischemic conditions.[8]

Other pathologies that should be considered in the differential diagnosis of right ventricular aneurysm include Uhl's anamoly, Ebstein anomaly, and congenital absence of the right pericardium.[9] Uhl anomaly is congenital deficiency of the right ventricular myocardium, while Ebstein anomaly is the apical location of the septal and posterior leaflet of the tricuspid valve and can be defined as atrialization of the right ventricle.[9]

Large size, rapid growth, originated from the left ventricle, significant atrioventricular valve insufficiency, the presence of a pericardial effusion and a hydrops fetalis are associated with a poor prognosis. Prenatally detected cases have more increased mortality and morbidity risk than postnatally detected ones.[4,10] Zeng et al. speculated that aneurysms and diveticulum located in the basal segments of the right ventricle might not be pathological.[2] Right ventricle located pathologies may be caused by prenatally unbalanced pressure . After birth, the right heart pressure declines with the establishment of pulmonary circulation and such ventricular outpouching cases may show some degree of regression in their sizes.[2] Our right ventricular

aneurysm case also showed some regression in a year follow-up and remained asymtomatic.

Ventricular aneurysms and diverticula are sometimes associated with conduction abnormalities detected in-utero or postnatally.[8] This case had intermittent bradycardia in the postpartum first days. Electrocardiographic findings showed bi-geminy beats however, the arrhythmia resolved without any medication and Holter monitoring was normal. The majority of the surviving cases remain asymptomatic without any intervention due to regression or resolution of the lesions. Although the optimal postnatal treatment strategy is uncertain, the expectant management is particularly suitable for patients who remain asymptomatic. Surgical intervention can be considered for patients who are at high risk for complications and/or with other associated cardiac lesions requiring surgical intervention. [4]

Conclusion

This fetal right ventricle aneurysm case highlights that prenatal diagnosis allows to have a favorable prognosis via a multidiciplinary colloboration in intrauterine and postnatal period. Postnatally all babies should be evaluated by a pediatric cardiologist for confirmation of the diagnosis and close monitoring.

Informed Consent: Informed consent was obtained from the patient.

Conflicts of Interest: The authors declare no conflicts of interest.

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