Severe fetal cardiomegaly caused by multiple non-giant placental chorioangiomas

Journal:	*Cardiology in the Young*
Manuscript ID	CTY-19-Jun-255.R2
Manuscript Type:	Brief Report
Date Submitted by the Author:	27-Aug-2019
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Keywords:	Fetal cardiomegaly, Placental chorioangioma, Extra-cardiac shunt, Cardiothoracic area ratio, Dilated umbilical vein
Manuscript Category:	Fetal Cardiology
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Title page

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Running head

Cardiomegaly by non-giant placental chorioangiomas

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Abstract

A pregnant woman was referred to our hospital due to fetal cardiomegaly. We recognized a dilated umbilical vein, which raised a suspicion of placental chorioangioma. A male neonate was delivered at 37 weeks of gestation. The cardiomegaly was gradually improved. Pathological examination identified five non-giant placental chorioangiomas. Multiple non-giant chorioangiomas may cause fetal complications despite the difficulty of prenatal diagnosis.

Main text

Introduction

Causes of fetal cardiomegaly include not only fetal cardiac disease, but also extra-cardiac shunt disease.[1] Among these, abnormal fetal circulations such as placental chorioangioma are greatly different from other diseases in terms of the requisite clinical management, because delivery may reduce the cardiac burden. We report a case in which fetal cardiomegaly due to multiple non-giant placental chorioangiomas was unable to be diagnosed prenatally, but was strongly suspected from the dilated umbilical vein.

Case

A 39-year-old pregnant woman with no past or family history was referred to our hospital due to fetal cardiomegaly at 31 weeks of gestation. On presentation, fetal echocardiography showed a cardiothoracic area ratio of 0.55 (Fig.1a), but neither structural abnormality nor prominent valve regurgitation were detected, and contractility of both ventricles was maintained. Neither fetal echography nor magnetic resonance imaging revealed no extra-cardiac shunt disease. We recognized a thickly expanded umbilical cord and dilated umbilical vein and artery (Fig.1b, c), which raised a suspicion of shunt diseases in the placenta such as placental chorioangioma. However, we were

unable to reach a definitive diagnosis. The flow pattern of umbilical artery was normal (Fig.1d). However, the flow pattern of umbilical vein was pulsatile (Fig.1e), and that of inferior vena cava had retrograde component (Fig.1f), so it has been suggested cardiac function declines. We continued careful monitoring for the occurrence of hydrops or fetal heart failure under hospitalization. Up to the time of delivery, findings from fetal echography did not show any marked changes. No fetal arrhythmia was seen, and anti-SS-A and anti-SS-B antibodies were negative in maternal blood testing. Non-invasive prenatal testing showed no abnormalities.

A male neonate was delivered by selective caesarean section at 37+1 weeks of gestation with a birth weight of 3,114 g without asphyxia. No external malformations were identified, but the umbilical cord was thick with a diameter of about 25 mm (Fig.2a). The cardiothoracic ratio on chest X-ray was 0.63. Echocardiography showed no structural abnormality, left ventricular ejection fraction was 50%, and left ventricular diameter at end diastole was 20 mm. The value of N-terminal pro-B-type natriuretic peptide was 2,156 pg/mL. Hemoglobin level and platelet count were normal. We started continuous intravenous infusion of milrinone after birth, considering the possibility of increased afterload due to withdrawal from the fetal circulation. A few days later, when we tried to reduce milrinone, his cardiac function apparently deteriorated, so it gradually declined

over two weeks. Although the value of N-terminal pro-B-type natriuretic peptide decreased to 143 pg/mL in two weeks, it rose to 236 pg/mL after stopping milrinone, so he was started to take pimobendan and discharged. Cardiothoracic ratio improved to 0.50.

Histopathological examination showed intimal thickening of vessels in the umbilical cord. Five chorioangiomas were identified in the placenta, with a maximum diameter of 3 cm (Fig.2b). We determined that these were the cause of fetal cardiomegaly.

Discussion

Placental chorioangioma is the most common placental tumor, found in 1% of all pregnancies. This disease is reported to cause fetal complications such as growth restriction, anemia, thrombocytopenia and hydrops, especially in cases with chorioangioma >4 cm in diameter, known as giant chorioangioma. However, most chorioangiomas are small and can be found in postpartum placental pathology examination without any complications ever presenting.[2, 3]

What was noteworthy in our case was that multiple non-giant chorioangiomas may cause fetal complications despite the difficulty of prenatal diagnosis. While color Doppler echography is considered useful for diagnosing chorioangioma, prenatal diagnosis is sometimes difficult for small lesions.[4] When fetal cardiomegaly and a dilated

umbilical vein are identified, this disease should be suspected even if a definitive diagnosis cannot be reached from echography.

Acknowledgements

The authors would like to thank Dr Yoshinori Moriyama, an obstetrics and gynecologist in our hospital, and Dr Naoki Ohashi, a pediatric cardiologist in Chukyo Children Heart Center, for discussions that led to diagnosis.

Financial Support

This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

Conflicts of Interest

None.

Ethical Standards

The authors assert that all work reported complies with the ethical standards of the Helsinki convention, and institutional and national research committee.

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Figures

Figure 1. Fetal echography findings

a) Cardiothoracic area ratio is 0.55 in fetal echocardiography.

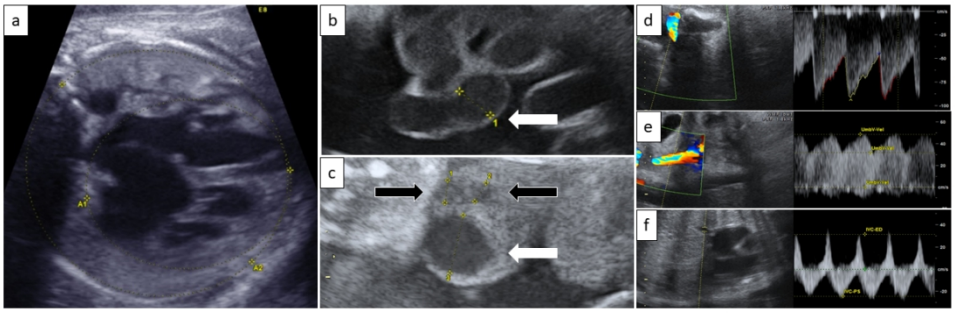
b, c) The umbilical cord is thick, with an umbilical vein diameter of 12 mm (white arrow) and an umbilical artery diameter of 5 mm (black arrow).

d-f) The flow pattern. (d): umbilical artery, (e): umbilical vein, (f): inferior vena cava. Note the pulsatile pattern in the umbilical vein and the retrograde flow in the inferior vena cava, which suggests the decreased cardiac function of the fetus.

Figure 2. Findings after birth

a) Diameter of the umbilical cord at birth is about 25 mm.

b) The largest placental chorioangioma is about 3 cm along the major axis.



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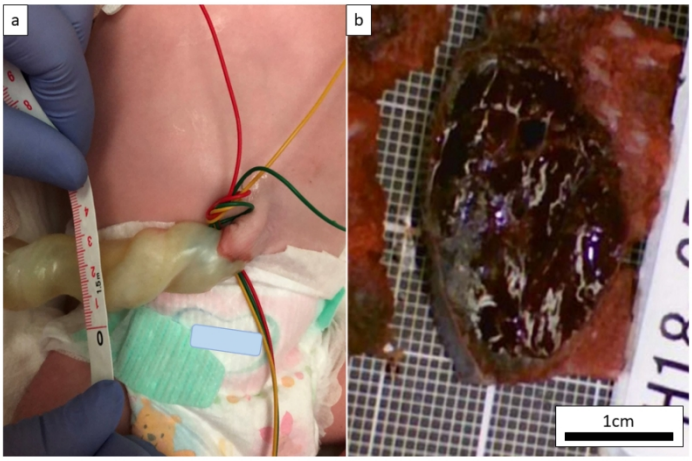

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