

Fetal Congenital Cardiac Diverticulum with Pericardial Effusion: A Case Treated by Urgent Thoracic Surgery

L Daou, N Hanna, H Sayah and I Melki

Department of Pediatrics, Hotel Dieu de France Hospital, Beirut, Lebanon

Abstract

A case of fetal congenital cardiac diverticulum, diagnosed at 36 weeks of gestation. The fetus presented with a large cardiac effusion one day before his birth, and an active pericardial bleeding with tamponade and severe bradycardia right before the urgent C-section. Drainage of the effusion done right after the delivery, with good neonatal outcome.

Keywords: Cardiac diverticulum; Pericardial effusion; Active pericardial bleeding, Tamponade

Received: December 07, 2015; **Accepted:** December 16, 2015; **Published:** December 23, 2015

Case Report

A healthy 26-year-old woman, gravida 2 para 2 aborta 0, with a good course of pregnancy. An ultrasound done at 35 weeks of gestation was normal. In a routine third trimester ultrasound, done at 36 weeks of gestation, the fetus presented with a minimal pericardial effusion.

The second day, the ultrasound was repeated by another obstetrician, with the same minimal cardiac effusion, a good heart rate and normal systolic function.

On the same afternoon, the mother was referred to a pediatric cardiologist for assessment. An ultrasound done showed that the pericardial effusion had become enormous, causing cardiac tamponade and severe bradycardia (30 beats/min), without architectural anomalies (**Figure 1**).

During the exam, the cardiologist observed that the effusion, previously hypo echoic, was progressively becoming hyper echoic, before turning into a complete hyper echoic effusion 10 minutes after (**Figure 2**).

These results proved that the fetus was experiencing an active pericardial bleeding at the time of the ultrasound.

Considering the life-threatening nature of the situation, the mother was sent to Hotel Dieu de France for an urgent C-section.

An obstetrician, a neonatal pediatrician and a pediatric cardiac surgeon along with the pediatric cardiologist stood ready to handle the case.

Corresponding author: L Daou

✉ lindadaou@hotmail.com

Pediatric cardiologist, Department of pediatrics, Hotel Dieu de France Hospital, Beirut, Lebanon

Citation: Bakhtyar N, Sivayoganathan T, Jeschke MG. Therapeutic Approaches to Combatting Hypermetabolism in Severe Burn Injuries. J Intensive & Crit Care 2015, 1:1.

A C-section was performed and the baby girl was born with an Apgar score of 7 and 9, at 1 and 5 minutes of birth respectively. A cardiac ultrasound done at birth showed the same hyper echoic structure, surrounded by a new pericardial effusion.

In view of the case, the C-section was exceptionally performed in the cardio-vascular operating theater so that the newborn can be directly transferred to the adjacent operating room.

At the start of surgery, the newborn was hemodynamically unstable. As soon as the pericardial effusion was drained (30



Figure 1 Ultrasound showing enormous pericardial effusion.

ml of bloody fluid followed by blood clots), the patient became stable. A cardiac diverticulum was found localized at the end of the ventricular septum, taking its origin from the right ventricle (**Figure 3**).

Three stitches were done on the diverticulum to stop the bleeding. Good course of the surgery, done in one hour 20 minutes.

The newborn was transferred to the neonatal intensive care unit for medical supervision. Good course in the hospital, no complications during her stay at the intensive care unit. A cardiac ultrasound done at day 4 of life showed no pericardial effusion and a normal systolic function. She left the hospital at day 5 of life. At the time of writing, the child was asymptomatic and in a good general health.

Discussion

Cardiac ventricular diverticula are localized protrusions of the wall of the cardiac ventricles with a narrow connection to the ventricle. They are usually isolated lesions [1-3].

Congenital protrusion of the cardiac ventricular wall has been

variably defined in the literature as diverticulum or aneurysm. The real incidence of these conditions is not known, since many cases may be asymptomatic [4-7].

The etiology of cardiac diverticula and aneurysms in fetal life is poorly understood. They may occur as result of focal weakening of the ventricular wall due to an interruption during embryogenesis, infection [8-10], or from localized ischemia of the ventricular wall from diseased coronary arteries such as stenosis, hypoplasia or intimal proliferation [8-11]. Most cardiac diverticula have been reported from mid-gestation [4, 12].

A common mode of presentation is an abnormal four-chamber view, but they can also be associated with fetal arrhythmias [13, 14], pericardial effusions [4] or even fetal hydrops [12].

The prognosis of diverticula is usually good, but it will depend on location, associated abnormalities, signs of cardiac impairment and evolution during pregnancy.

Postnatal surgical intervention may be necessary. There are, however, few reports in early pregnancy, some leading to termination [4, 12].



Figure 2 Ultrasound showing a complete hyper-echoic effusion.



Figure 3 Cardiac diverticulum localized at the end of the ventricular septum.

References

- 1 Teske DW, McGovern JJ, Allen HD (1993) Congenital fibrous left ventricular diverticulum. *Am Heart J* 126: 1233-1235.
- 2 Hallali P, lung B, Davido A, Binet JP, Leriche H, et al. (1989) Congenital diverticulum of the right ventricle: report of two cases associated with other congenital defects. *Am Heart J* 117: 957-959.
- 3 Nicod P, Laird WP, Firth BG, Fixler D (1984) Congenital diverticula of the left and right ventricle: 3 cases. *Am J Cardiol* 53: 342-344.
- 4 Cavalle-Garrido T, Cloutier A, Harder J, Boutin C, Smallhorn JF (1997) Evolution of fetal ventricular aneurysms and diverticula of the heart: an echocardiographic study. *Am J Perinatol* 14: 393-400.
- 5 Matias A, Fredouille C, Nesmann C, Azancot A (1999) Prenatal diagnosis of left ventricular aneurysm: a report of three cases and a review. *Cardiol Young* 9: 175-184.
- 6 McElhinney DB, Silverman N (1999) Left ventricular aneurysm in the fetus: a diagnosis with a mixed prognosis. *Cardiol Young* 9: 123-126.
- 7 Brachlow A, Sable C, Smith S, Slack M, Martin G (2002) Fetal diagnosis and postnatal follow-up of an asymptomatic congenital left ventricular diverticulum. *Pediatr Cardiol* 23: 658-660.
- 8 Gembruch U, Steil E, Redel DA, Hansmann M (1990) Prenatal diagnosis of a left ventricular aneurysm. *Prenat Diagn* 10: 203-209.
- 9 Treistman B, Cooley DA, Lufschanowski R, Leachman RD (1973) Diverticulum or aneurysm of the left ventricle. *Am J Cardiol* 32: 119-123.
- 10 Mardini MK (1984) Congenital diverticulum of the left ventricle. Report of two unusual cases. *Br Heart J* 51: 321-326.
- 11 Cavalle-Garrido T, Cloutier A, Harder J, Boutin C, Smallhorn JF (1997) Evolution of fetal ventricular aneurysms and diverticula of the heart: an echocardiographic study. *Am J Perinatal* 14: 393-400.
- 12 Sepulveda W, Drysdale K, Kyle PM, McNeal AD, Moore IE (1996) Congenital left ventricular aneurysm causing hydrops fetalis: prenatal diagnosis with color Doppler ultrasonography. *J Ultrasound Med* 15: 327-331.
- 13 Tsujimoto H, Takeshita S, Kawamura Y, Nakatani K, Sato M (2000) Isolated congenital left ventricular diverticulum with perinatal dysrhythmia: a case report and review of the literature. *Pediatr Cardiol* 21: 175-179.
- 14 John JB, Bricker JT, Fenrich AL, Vick GW, El-Said HG, et al. (2002) Images in cardiovascular medicine. Fetal diagnosis of right ventricular aneurysm associated with supraventricular tachycardia with left bundle-branch block aberrancy. *Circulation* 106: 141-142.